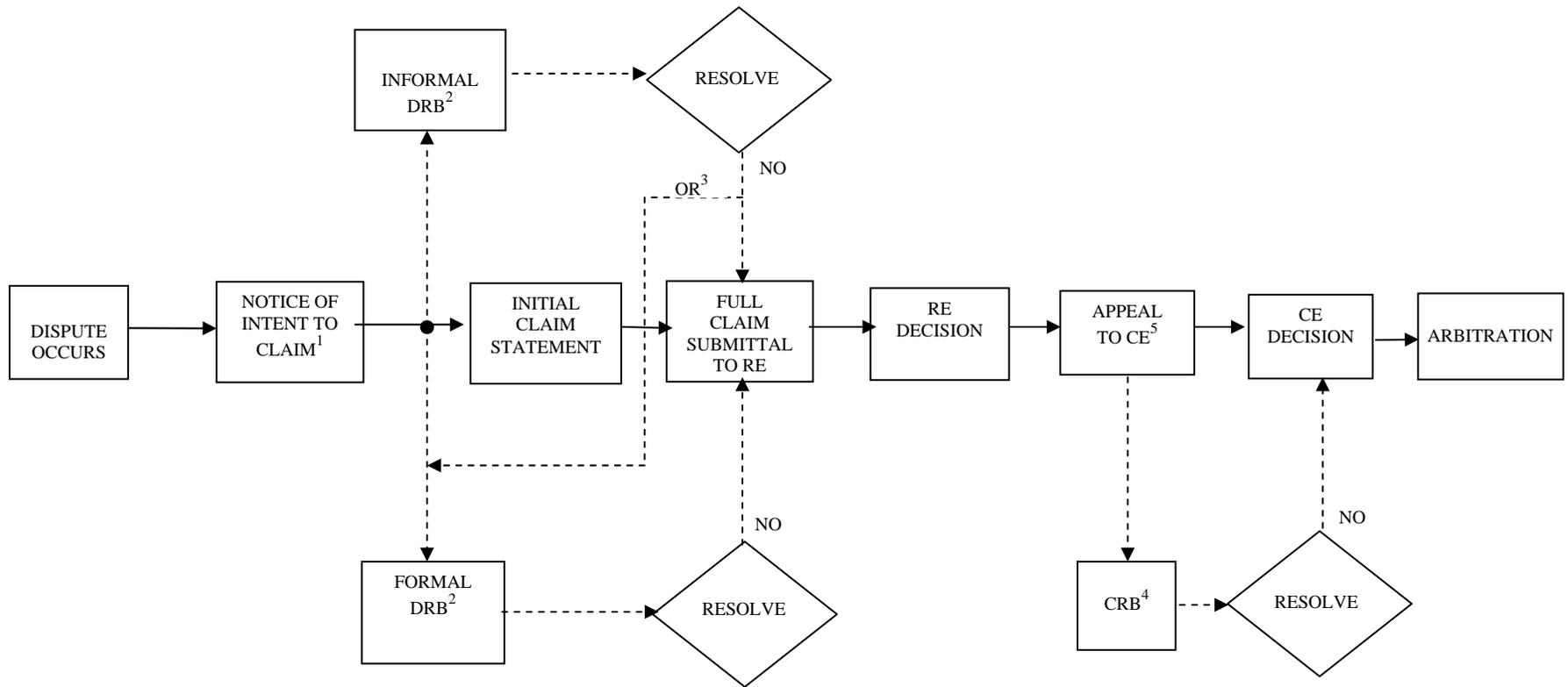


CONSTRUCTION DISPUTE RESOLUTION PROCESS



NOTES:

1. Notice of Intent to Claim must be given per Subsection 105.17 as soon as the dispute occurs. Don't wait to see if the dispute can be resolved through further negotiations between the Contractor and the RE or through the DRB process.
2. DRB (Dispute Review Board) is a Special Provision and is not included in all contracts. Formal or Informal DRB may be requested at any point during the RE review after Notice of Intent to Claim. A DRB hearing will be held if requested by either party. The DRB decision is non-binding.
3. Informal DRB may be resubmitted to formal DRB.
4. CRB (Claim Review Board). A CRB hearing will be held if agreed to by both parties. CRB will not be available on those projects where a DRB was established and available to review the dispute. The CRB decision is non-binding. See Subsection 105.18.
5. Upon appeal to the Chief Engineer, a complete claim package is to be sent to the FHWA for their review on all Federal-aid full oversight projects.

MANUAL UPDATE COVER SHEETTO CONTRACT ADMINISTRATION MANUAL HOLDERS NO. 163FROM CONSTRUCTION SECTION DATE JUNE 30, 2006
(ORIGINATING SECTION)**PLEASE UPDATE YOUR CONTRACT ADMINISTRATION MANUAL AS DESCRIBED BELOW:**

1. Remove subsection 104.02, dated 6/11/2002

Insert updated subsection 104.02 dated 6/30/06

2. Remove exhibit 105.17-1, (Construction Dispute Resolution Process) dated 8/25/04

Insert revised exhibit 105.17-1, dated 6/30/06

3. Remove pages 16-21 of subsection 107.17, dated 06/11/02

Insert pages 16-17 of subsection 107.17, dated 6/30/06

4. Remove subsection 107.20

Insert updated subsection 107.20 (reformatted with correct page number only)

5. Remove subsection 107.22

Insert updated subsection 107.22 (reformatted with correct page number only)

6. Remove pages 14-20 of subsection 113.03

Insert updated pages 14-20 of subsection 113.03, (changes to sanctions for DBE non-compliance)

7. Insert new subsection 512, Gabion Structures, dated 6/30/06

8. Insert subsection 634 (second page of this subsection), dated 6/30/06

9. Insert new subsection 640, Incidental Construction

10. Remove all of subsection 656, dated 3/16/2004

Insert updated subsection 656, dated 6/30/06

M:\Construction\CAManual\Update Cover Sheets\CA Manual Memo Update Cover 162 04 22 05.doc

By _____ GENE WORTHAM, P.E. CONSTRUCTION ENGINEER
(Typed Name) (Title)

If you have any questions, call 334-8859

104.01 PARTNERING

Partnering promotes communication between the Idaho Transportation Department (ITD) and the Contractor, and is used to identify and promote reciprocal goals. The objectives of partnering include:

- Complete projects within budget and on schedule.
- Increase responsiveness and timeliness of decisions.
- Improve problem solving.
- Reduce paperwork and rework.
- Eliminate litigation.

The backbone of partnering is the development of a win-win relationship between ITD and the Contractor that discourages gain by one at the other's expense. However, partnering does not mean a waiving of contract plans and specification requirements. The majority of ITD's projects now include a voluntary partnering specification. To implement this partnering specification, ITD's Resident/Regional Engineer and the Contractor's Project Manager jointly plan a Partnering Workshop. The Partnering Workshop should be held within thirty (30) days after the Notice to Proceed and before the Preconstruction Conference.

Workshop Location and Length

The workshop should not be held at ITD's District office or the Contractor's office, but rather at a neutral location such as a local hotel conference room, or a restaurant's banquet facility. Simple projects typically require ½ a day; complex projects with many issues may require 1½ to 2 days.

Workshop Attendees

All stakeholders (someone who has a vested interest in the successful completion of the project) should be invited. Attendees will vary depending upon the project, but should be the key people or the decision-makers in an organization. Possible workshop attendees include:

- | | |
|--|-----------------------|
| Contractor Project Staff | Contractor Management |
| ITD Construction Staff | ITD Design Staff |
| ITD Management | Subcontractors |
| Suppliers | Design Consultants |
| Government Agencies (FHWA, Forest Service, Cities, Indian Communities, Etc.) | |

Facilitator

The selection of the Workshop Facilitator is critical to the workshop's success. Consideration may be given to bringing in an outside facilitator on large and/or complex projects to further reinforce the "neutral ground" framework. Contact the Construction section for facilitator references.

Cost

ITD and the Contractor will equally share the cost of the partnering workshop, including renting meeting space, providing lunch or refreshments, and hiring the facilitator.

Workshop Agenda

Six major elements in a Partnering Workshop are:

1. **Introduce each partner.** Discuss job relationship and responsibilities.
2. **Develop mission statement, goals, and objectives.** Establish mutually agreed-upon goals and measurable objectives, e.g., completing the project on time or ahead of schedule, setting safety, cost, or quality goals.
3. **Identify problems, issues, or opportunities for the project.**
 - Project opportunities/alternatives -- Detour instead of staged construction could save time and costs.
 - Prioritize issues and develop action plans that define the issue, the person responsible for the solution, and the date the solution is required.
4. **Develop problem resolution/escalation process.** Identify authority levels, timelines for decisions, and who is responsible for what types of decisions. Define the relationship of all parties (i.e., consultant designers, other agencies, utility companies, etc.)

Problem resolution should be at the lowest level.
If no agreement can be made, immediately escalate to the next level.
No decision or ignoring the problem is not acceptable.

5. **Develop an evaluation process and an evaluation form.** Base the items to be evaluated on the project goals (e.g., project goal - speed up the review process of shop drawings). Use a rating system of 1 (poor) to 5 (good), with space for comments. Each stakeholder should evaluate the project every thirty to sixty (30 to 60) days or as determined by the project team. The Contractor's management and ITD management should review and take corrective action, if required.
6. **Sign a charter** that has the mission statement and common goals (see Exhibit 104.01-1).

Monitor Progress

Hold follow-up workshops to address problem areas or issues that hinder successful performance and to reiterate the project goals and objectives. The Contractor's project staff and ITD construction staff should hold follow-up sessions on a weekly basis. The Contractor management and ITD management should meet on a monthly basis or as adjusted by partner agreement.

**Remember a partnering agreement does not waive
the terms of the contract nor change the plans or specifications.**

PARTNERING CHARTER
for
Fairfield IC to MP 103.5
Project No. IR-84-2(35)95

We are a team dedicated to providing a quality project in accordance with the contract. We are committed to employee and public safety, environmental protection and minimizing public inconvenience, as described in the objectives listed below:

PERFORMANCE OBJECTIVES:

- Build a quality project,
- Provide a safe job site,
- Complete this job on time,
- Realize a reasonable profit,
- Minimize public inconvenience,
- Earn 90% of the ride specification bonus.

ADMINISTRATIVE OBJECTIVES:

- Finish this job with no claims,
- No property damage over \$1,000,
- Minimize paperwork,
- Minimize change orders.

COMMUNICATION OBJECTIVES:

- Make consistent, timely decisions at the lowest possible level,
- Work toward timely conflict resolution,
- Use experience and knowledge gained on this job to better design next project phase.

We, the undersigned, agree to make a good faith effort to implement the above objectives.

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]

104.02 VARIATION IN QUANTITIES

Contract bid item quantities are estimated and subject to variation during construction. The Engineer may increase or decrease quantities as necessary to complete the project. The percentage of completion of items should be checked at each progress estimate. If it appears that an item will vary by more than 25%, then the contract unit price should be evaluated for reasonableness. If the price is not reasonable (i.e too high), the Engineer should request a price adjustment justification from the Contractor. The Contractor also has the right to request a price adjustment when quantities vary by more than 25% subject to the limitations of Subsection 104.02.

Comment [jh1]: If you place the phrase at the end of the sentence it is better grammar.

Quantity Variation – With Price or Contract Time Adjustment

If a quantity variance requires a price or contract time adjustment, a change order must be written to make the adjustment. See Section 104.03. If the Engineer and the Contractor cannot agree to a price adjustment, the Engineer may establish a price for the work or price it on a force account basis per Subsection 109.03.

Calculate the required price adjustment as soon as actual costs and final quantities can be reasonably determined.

Quantity Variation – Without Price Adjustment

If the Engineer determines the contract unit price is reasonable, and the Contractor has not requested a price adjustment, then work will continue at the contract unit price. Agreement to continue at the contract unit price should be agreed to by the Contractor and documented in writing. A sample form for documenting agreement to continue work at contract price or for requesting a price adjustment is shown in Figure 104.02.1. The sample form may be modified as needed by the Engineer. In some cases, a formal change order may be warranted.

Comment [jh2]: Are there specific cases where a change order is warranted that should be included here?

107.01 LAWS TO BE OBSERVED

The Contractor shall observe and comply with all applicable laws, ordinances, regulations, orders, and decrees.

Construction Safety

Occupational Safety and Health Act (OSHA) and Mine Safety and Health Act (MSHA) are federal laws regulating safety practices in most industries and work activities throughout the United States. Because OSHA and MSHA are federal laws, they are made part of the Standard Specifications by reference in Subsection 107.01.

As with any other specification, state construction personnel must see that Contractors adhere to OSHA/MSHA requirements, even though the primary responsibility for enforcement has been placed on the Federal Department of Labor. All Contractors must comply with OSHA/MSHA regulations applicable to their contracts and advise all subcontractors of the required safety requirements to which they are also subject. Each Residency should have copies of the informational guides on OSHA and MSHA for ready reference.

Upon award of the contract and prior to the preconstruction conference, the Resident/Regional and Project Engineers are encouraged to study the plans, specifications, and other contract documents to identify specific safety aspects that should be discussed at the preconstruction conference.

Safety posters that should be placed on the bulletin board at the job site are:

1. Job Safety and Health Protection. (Exhibit 107.01-1)
2. Emergency Phone Numbers. (Exhibit 107.01-2)

Any questions project personnel have concerning OSHA/MSHA compliance should first be referred to the District EEO/Safety/Training Coordinator, whose duty is to assist project personnel in this area and provide on-the-job training of project personnel.

Additional assistance may be requested of Construction personnel and the headquarters' Employee Safety/Risk Manager if the need warrants.

Preconstruction Conference and Preoperational Meetings

Prior to starting work at the site, the Contractor is requested to confer with representatives of the Division of Highways to provide for the integration of safety into the project during the planning stages and to arrive at a clear understanding on how safety issues will be handled. The safety aspect can be a part of the general preconstruction conference; however, sufficient time must be allotted to cover aspects of safety integration, including proposals for handling specific hazards.

A preoperational meeting may allow a more thorough discussion of safety since the meeting will focus more on the "nuts and bolts" aspects of a particular operation. Any safety concerns can be discussed in detail. The suggested topics in Exhibit 107.01-3 are common safety concerns that should be discussed during preconstruction and preoperational meetings. These topics are intended only as reminders of applicable references to important safety regulations and are by no means complete. For more detail, please refer to the appropriate Federal Register reference.

job safety and health protection

The Occupational Safety and Health Act of 1970 provides job safety and health protection for workers through the promotion of safe and healthful working conditions throughout the Nation. Requirements of the Act include the following:

Employers: Each employer shall furnish to each of his employees employment and a place of employment free from recognized hazards that are causing or are likely to cause death or serious harm to his employees; and shall comply with occupational safety and health standards issued under the Act.

Employees: Each employee shall comply with all occupational safety and health standards, rules, regulations and orders issued under the Act that apply to his own actions and conduct on the job.

The Occupational Safety and Health Administration (OSHA) of the Department of Labor has the primary responsibility for administering the Act. OSHA issues occupational safety and health standards, and its Compliance Safety and Health Officers conduct jobsite inspections to ensure compliance with the Act.

Inspection: The Act requires that a representative of the employer and a representative authorized by the employees be given an opportunity to accompany the OSHA inspector for the purpose of aiding the inspection.

Where there is no authorized employee representative, the OSHA Compliance Officer must consult with a reasonable number of employees concerning safety and health conditions in the workplace.

Complaint: Employees or their representatives have the right to file a complaint with the nearest OSHA office requesting an inspection if they believe unsafe or unhealthful conditions exist in their workplace. OSHA will withhold, on request, names of employees complaining.

The Act provides that employees may not be discharged or discriminated against in any way for filing safety and health complaints or otherwise exercising their rights under the Act.

An employee who believes he has been discriminated against may file a complaint with the nearest OSHA office within 30 days of the alleged discrimination.

Citation: If upon inspection OSHA believes an employer has violated the Act, a citation alleging such violations will be issued to the employer. Each citation will specify a time period within which the alleged violation must be corrected.

The OSHA citation must be prominently displayed at or near the place of alleged violation for three days, or until it is corrected, whichever is later, to warn employees of dangers that may exist there.

Proposed Penalty: The Act provides for mandatory penalties against employers of up to \$1,000 for each serious violation and for optional penalties of up to \$1,000 for each nonserious violation. Penalties of up to \$1,000 per day may be proposed for failure to correct violations within the proposed time period. Also, any employer who willfully or repeatedly violates the Act may be assessed penalties of up to \$10,000 for each such violation.

Criminal penalties are also provided for in the Act. Any willful violation resulting in death of an employee, upon conviction, is punishable by a fine of not more than \$10,000 or by imprisonment for not more than six months, or by both. Conviction of an employer after a first conviction doubles these maximum penalties.

Voluntary Activity: While providing penalties for violations, the Act also encourages efforts by labor and management, before an OSHA inspection, to reduce injuries and illnesses arising out of employment.

The Department of Labor encourages employers and employees to reduce workplace hazards voluntarily and to develop and improve safety and health programs in all workplaces and industries.

Such cooperative action would initially focus on the identification and elimination of hazards that could cause death, injury, or illness to employees and supervisors. There are many public and private organizations that can provide information and assistance in this effort, if requested.

More Information: Additional information and copies of the Act, specific OSHA safety and health standards, and other applicable regulations may be obtained from your employer or from the nearest OSHA Regional Office in the following locations:

- Atlanta, Georgia
- Boston, Massachusetts
- Chicago, Illinois
- Dallas, Texas
- Denver, Colorado
- Kansas City, Missouri
- New York, New York
- Philadelphia, Pennsylvania
- San Francisco, California
- Seattle, Washington

Telephone numbers for these offices, and additional Area Office locations, are listed in the telephone directory under the United States Department of Labor in the United States Government listing.

Washington, D.C.
1977
OSHA 2203



Ray Marshall
Ray Marshall
Secretary of Labor

U. S. Department of Labor
Occupational Safety and Health Administration

EMERGENCY PHONE NUMBERS

Physician_____ **or** _____

Hospital_____ **or** _____

Ambulance_____ **or** _____

Fire Department_____ **or** _____

Police_____ **or** _____

Post in a conspicuous location, in accordance with OSHA Reg.1926.50

SAFETY REQUIREMENTS CHECKLIST	
EARTHWORK AND GRADING OPERATIONS	
Safety Requirements	Code of Federal Regulations
SAFETY PLAN – OSHA Posters, Emergency Numbers	29 CFR 1926.20-24
PERSONAL PROTECTION - Hard Hats, Hearing, Eyes and Face	29 CFR 1926.100-.107
FUEL STORAGE TANKS - Diked, Placarded, Fire Extinguishers, No Smoking Signs	29 CFR 1926.150-.155
TRAFFIC CONTROL PLAN – Certified Flagpersons and All Traffic Control Devices per MUTCD and NCHRP-350	29 CFR 1926.200-.203
HOUSEKEEPING – Storage and Disposal of Scrap and Debris	29 CFR 1926.25
OXYGEN AND ACETYLENE TANKS - Upright and Properly Secured and Stored	29 CFR 1926.350
CRANE – Inspection Records, Proximity to Power Lines, Capacity Chart, Boom Angle	29 CFR 1926.550
EQUIPMENT UNATTENDED - Parked Overnight Away From Travelway, Attached Equipment Lowered	29 CFR 1926.600
EQUIPMENT SAFETY DEVICES – Seat belts, Rollover Protection, Back-Up Alarms, Bed Stops on All Dump Trucks	29 CFR 1926.601-.602
EXCAVATION – Repose Angle, Shoring Banks Over 5' High	29 CFR 1926.650-.653
TRUCKS- Haul Legal Weight and Avoid Spillage	Idaho Code
CRUSHER AND AGGREGATE TREATMENT PLANTS	
SAFETY PLAN – OSHA Posters, Emergency Numbers, MSHA Placards	29 CFR 1926.20-24
PERSONAL PROTECTION - Hard Hats, Hearing, Eyes and Face	29 CFR 1926.100-.107
FUEL STORAGE TANKS - Diked, Placarded, Fire Extinguishers, No Smoking Signs	29 CFR 1926.150-.155
TRAFFIC CONTROL PLAN – Certified Flagpersons and All Traffic Control Devices per MUTCD and NCHRP-350	29 CFR 1926.200-.203
PLANT – Start-Up Alarm Signal	29 CFR 1926.555
HOUSEKEEPING – Storage and Disposal of Scrap and Debris	29 CFR 1926.25
OXYGEN AND ACETYLENE TANKS - Upright and Properly Secured and Stored	29 CFR 1926.350
LADDERS - Adequate and Properly Secured	29 CFR 1926.450-.452
CONVEYORS - Belt and Drive Guards in Place	29 CFR 1926.555
EXCAVATION – Safe Repose Angle in Pit	29 CFR 1926.651
TRUCKS- Haul Legal Weight and Avoid Spillage	Idaho Code

CONTRACT ADMINISTRATION**Legal Relations & Responsibility to Public****107.01**

ELECTRICAL SERVICE - Ground Fault Circuit Interrupter (GFCI)	29 CFR 1926.404
POWER CORDS AND CONNECTIONS - Proper and Well Located	29 CFR 1926.400-.432
TRUCKS AND LOADERS – Back-Up Alarms, Bed Stops and Other Equipment Safety Devices	29 CFR 1926.600-.606
<i>Review Drilling and Blasting Safety if Quarry Operations are Involved</i>	
DRILLING AND BLASTING	
SAFETY PLAN – OSHA Posters, Emergency Numbers, MSHA Placards	29 CFR 1926.20-24
PERSONAL PROTECTION - Hard Hats, Hearing, Eyes and Face	29 CFR 1926.100-.107
FUEL STORAGE TANKS - Diked, Placarded, Fire Extinguishers, No Smoking Signs	29 CFR 1926.150-.155
AIR LINE CONNECTIONS - Securely Fastened and Equipped With Safety Chains	29 CFR 1926.302
WARNING SIGNS - Posted Properly Marking Work Area	29 CFR 1926.900
EXPLOSIVE STORAGE – Magazine Requirements	29 CFR 1926.904
CHARGE INITIATION – Safety Fuse, Detonating Cord, Misfires	29 CFR 1926.905-.911
BLASTING SIGNALS – Signal Sequence, Signs, Flaggers	29 CFR 1926.909
BLASTER QUALIFICATION – Training, Experience, Knowledge	29 CFR 1926.901
EXCAVATION - Angle of Repose	29 CFR 1926.651
TRANSPORTING EXPLOSIVES – Vehicle Placards	29 CFR 1926.902
SECURITY - Authorized Personnel, Inventories, Blast Mats, Warning Signals	29 CFR 1926.900
MSHA TRAINING - Quarry and Pit Operations—Requires Contractor to Conduct and Document Hazards Recognition Training	
SEAL COATING AND PAVING	
SAFETY PLAN – OSHA Posters, Emergency Numbers	29 CFR 1926.20-24
HOUSEKEEPING – Storage and Disposal of Scrap and Debris	29 CFR 1926.25
PERSONAL PROTECTION - Hard Hats, Hearing, Eyes, Face, Respirators	29 CFR 1926.100-.107
FUEL STORAGE TANKS - Fire Extinguishers, 20 ABC on Distributors, No Smoking Signs	29 CFR 1926.150-.155
TRAFFIC CONTROL PLAN – Certified Flagpersons and All Traffic Control Devices per MUTCD and NCHRP-350	29 CFR 1926.200-.203
TRUCKS AND LOADERS – Back-Up Alarms, Truck Bed Stops	29 CFR 1926.600-.601

STRUCTURES (BRIDGES, OVERPASSES, ETC.)	
SAFETY PLAN – OSHA Posters, Emergency Numbers	29 CFR 1926.20-24
HOUSEKEEPING – Storage and Disposal of Scrap and Debris	29 CFR 1926.25
PERSONAL PROTECTION - Hard Hats, Hearing, Eyes and Face Protection, Safety Nets, Lifelines	29 CFR 1926.100-.107
FUEL STORAGE TANKS – Diked, Placarded, Fire Extinguishers, No Smoking Signs	29 CFR 1926.150-.155
TRAFFIC CONTROL PLAN – Certified Flagpersons and All Traffic Control Devices per MUTCD and NCHRP-350	29 CFR 1926.200-.203
MATERIALS HANDLING AND STORAGE – Stable Platforms, Stacking Heights	29 CFR 1926.250
POWER TOOL CONDITION – Guards, Grounding	29 CFR 1926.300-.305
OXYGEN AND ACETYLENE TANKS – Upright, Properly Secured and Stored	29 CFR 1926.350
GFCI – On Electrical Service to Tools	20 CFR 1926.404
POWER CORDS AND CONNECTIONS – Proper and Well Located	29 CFR 1926.404
LADDERS AND SCAFFOLDS – Length, Side Rail Support, Toe Boards, Safe Access	29 CFR 1926.450-452
RAILING ON STAIRWAY OVER 4 RISERS – Smooth Top Rail, Toe Boards	29 CFR 1926.500
CRANE – Capacity Chart, Inspection Record Available, Proximity to Power Lines, Boom Angle Indicator	29 CFR 1926.550
EQUIPMENT – Unattended, Reverse Alarms, Parking Overnight	29 CFR 1926.600-606
EXCAVATION – Walkways Left Clear, Repose Angle, Shoring Requirements, Banks Over 5' (1.5 m) High	29 CFR 1926.650-653
FORMS, SHORING, SAFETY BELTS – Working Over Protruding Steel, Stripped Forms and Shoring Removed from Work Area	29 CFR 1926.700-703

Monitoring Construction Operations for Safety

Staffing and Preparation

The Resident/Regional, with the aid of other project personnel, shall continually monitor all phases of work to note and take action on any observed and reported violations of the safety provisions. To the extent practicable, copies of current safety standards and regulations should be readily available at the project site.

On-Site Monitoring

The degree of hazard on a job site depends upon the nature of the work environment and the way in which the work is performed. To minimize the likelihood of accidents, constant vigilance is essential. Project personnel, in connection with their everyday duties, must give constant attention to safety in the performance of the construction work.

Safety Inspections

The Idaho Transportation Department shall monitor compliance with all laws, rules, and regulations as well as the specifications and provisions of the contract.

Contractor employee safety and worksite safety are the direct responsibility of the Contractor and the subcontractors. Safety violations involving construction Contractor workers, suppliers, and delivery personnel when on ITD projects or associated production facilities will be handled in accordance with requirements in this section, Subsections 107.01 and 107.16 of the ITD Standard Specifications, and required provisions for federal-aid construction contracts part VIII.

Representatives of the Federal Highway Administration or department headquarters' staff may make safety inspections of the Contractor's operation from time to time. In addition, compliance officers of the federal and state safety enforcement agencies may make inspections. FHWA and department personnel should cooperate fully with officials of other agencies in conducting inspections of construction projects.

Any questions project personnel have concerning OSHA/MSHA compliance should first be referred to the District EEO/Safety/Training Coordinator, whose duty is to assist project personnel in this area and provide on-the-job training of project personnel.

Additional assistance may be requested of Construction personnel and the headquarters' Employee Safety/Risk Manager if the need warrants.

General Safety and Health Provisions

The Contractor must initiate and maintain an accident prevention program. The program must provide for frequent and regular inspections of the job sites, materials, and equipment that are made by competent persons designated by the Contractor.

The use of any machinery, tools, materials, or equipment that cannot meet the safety standards applicable to these items is prohibited. Unsafe items must be identified as unsafe by tagging, or made inoperable by locking the controls, or removed from the place of operations.

Only those employees qualified by training or experience or employees training under proper supervision are permitted to operate equipment and machinery.

Violations

Violations of safety regulations may be minor in nature or they may be serious. Judgment must be exercised in interpreting the safety standards and determining the degree of hazard. Most deficiencies are minor and notifying the Contractor orally may be all that is necessary to remedy the violation. Oral or written notices to the Contractor should specify the safety regulation that is not being fulfilled. ***Project personnel should not instruct a Contractor on how to correct a deficiency.***

Minor violations can be verbally reported to the person in charge and/or the project engineer or project inspector. Violations that are adequately and quickly resolved and do not involve injuries or near misses do not require written reports unless the violation is frequent or the corrective action taken is not adequate.

Unsafe conditions or acts that jeopardize the safety of employees or the public must be reported to the supervisor and/or project inspector on the ITD-2713, Safety Inspection Report. Copies should be given to the supervisor on site and distributed to others as appropriate. Photographs including the violation should be taken whenever practicable. A copy of any written notice of violation should be sent to the District EE/Safety/Training Coordinator.

In the event that a condition of "imminent danger" exists (see DOH memorandum 15 for definition), the ITD representative will:

- Issue an immediate oral directive to cease work and correct the deficiency.
- If the deficiency is not fully and promptly corrected, the ITD Project Engineer will issue a written order stopping all or part of the work as necessary until the hazard is eliminated (per subsection 108.05). If all or part of the work is suspended to get compliance, an ITD-2242, Status of Work, must be completed stating the reason for suspension in the appropriate space.

If the deficiency is not corrected immediately, or repeated violations occur, take a photograph of the violation, provide written notice to the Contractor, and report the violation to your immediate supervisor, the District EEO/Safety/Training Coordinator, and the appropriate regulatory agency. The Occupational Safety and Health Administration (OSHA) has purview over most industrial work and the Mine Safety and Health Administration (MSHA) has purview on mining operations.

Safety violations involving construction Contractor workers, suppliers, and delivery personnel when on ITD projects or associated production facilities that involve a written notice will be kept on file with other project records. The District EEO/Safety/Training Coordinator will also maintain a file of all safety violations and their corrective action(s) along with all associated documentation that can be inspected as part of any project or safety review.

The District Engineer is responsible for ensuring that corrective action on reported violations occurs in a timely and appropriate manner.

Variations from Safety and Health Standards

In case of substantial engineering or other practical difficulties, a Contractor or subcontractor may request a variance from any of the published safety and health standards. Such requests must be fully justified in writing and submitted to the U.S. Department of Labor. The procedure for OSHA is set forth in Title 29, Code of Federal Regulations, Part 1926. The procedure for MSHA is set forth in Title 30, Code of Federal Regulations, Part 57.24. Approval may be granted upon a finding that the variance will provide safety measures that are as safe as those provided in the published standard.

Accidents Involving State Employees

Additional information on State employee safety issues and accidents is contained in the Employee Safety/Risk Management Manual. Coordinate all accident reporting with the District EEO/Safety/Training Coordinator.

107.02 PERMITS AND LICENSES

Tax Assessments by Counties – Equipment

Although each Contractor who performs work for the State must pay promptly when due all taxes, etc., questions often arise concerning assessments on equipment. Tax assessments are **not the only tax responsibility**, but one area of considerable interest to the Contractor. **The following is for information only:**

The Division of Highways and its personnel are not required to initiate any action on equipment assessments. The Contractor should be referred to each County Assessor where work is being performed. (Idaho Code, 63-1405, provides the basis for the County Assessor's actions.) The Roadway Design section notifies the counties that a Contractor will be working in their jurisdiction at the time the contract is awarded.

The Contractor is obligated to pay taxes on the assessed evaluation of the equipment domiciled in each county of the State, whether it is working or not. **The Contractor is required to contact the County Assessor of each county where the equipment is at and address the tax liability.**

Each assessor uses forms that the Contractor is asked to complete. The forms call for a listing of the Contractor's equipment by serial number, its cost and age, and time in county or counties of Idaho. Standard tables are used by the assessor to arrive at equitable assessment values and costs.

The department's position is to advise the Contractor of the tax obligation and to indicate the liability for taxes, license fees, and assessments. The department is obligated to withhold taxes due from Contractor's payment while working on our projects.

Upon receipt of the District Engineer's acceptance letter, the Construction section notifies all county and state taxing units and advises the taxing unit that they have fifteen (15) days to inform Financial Services of any tax obligations that are due. Final payment cannot be made until authorized by the taxing units. No further action is required by the District.

107.06 TRAFFIC CONTROL DEVICES

The Resident/Regional Engineer, on projects where public traffic is involved, shall designate one qualified individual who will normally be on the project every day to be responsible for traffic control and traffic control devices. The Contractor's certified worksite traffic control supervisor should work with the department's individual so all traffic control devices are reviewed on at least a daily basis to assure that changes in operations are reflected by appropriate changes in signing and other traffic control devices.

The person designated for traffic control and traffic control devices should be trained and have available for reference, the current Manual on Uniform Traffic Control Devices.

107.09 FOREST PROTECTION

Department personnel must be aware of and meet our commitments to the Forest Service on any projects that fall within National Forest boundaries.

The Chief Engineer signed a Memorandum of Understanding with the Forest Service in December of 1982 and amended it in May 1985. Part of this memorandum concerned construction activities within National Forest land as follows:

Construction

The State will:

- a. Invite the Forest Supervisor, or a representative, to attend the preconstruction conference with the successful bidder.
- b. Control construction under State contracts to assure work is in accordance with approved plans and agreements.
- c. Have the District Engineer contact the Forest Supervisor for agreement prior to starting any work under changed conditions that develop, prior to or during construction, which alter the land-use aspect of approved plans.
- d. Request the Forest Supervisor, or a representative, to participate in final project inspections.

The Forest Service will:

- a. Consult only with the District Engineer, or an on-the-job representative, on matters pertaining to project construction.
- b. Issue permits directly to the Contractor for burning, campsite locations, and water sources after agreement with the designated State representative. Copies of all permits issued will be furnished to the State.
- c. Participate in final project inspections and make recommendations to the State on matters related to Forest Service responsibilities for land and resource management.

107.10 RESPONSIBILITY FOR DAMAGE**Public Liability and Property Damage**

No work shall proceed until the contract is signed and the required Public Liability and Property Damage insurance is in force. (See Exhibit 107.10-1 for insurance procedures.)

Supplemental insurance (such as railroad insurance, XCU insurance, etc.) must be in force prior to starting and through the duration of the applicable portions of the project. The Resident/Regional shall see that the Contractor has submitted a copy of the insurance certificate before allowing the project to start.

Thirty (30) days prior to the expiration of a policy, the District should notify the Contractor to obtain an extension. If the Contractor does not submit an extension, the work must be suspended upon expiration of insurance.

In the event a motorist or property owner claims damage alleged to be caused by the Contractor or the Contractor's action, ITD personnel should, on request, advise the damaged party how to file a claim against the Contractor's insurance. The claimant should be given the name and address of the Contractor and the insurer. The claimant may also be advised that the alleged damage suffered should be fully described, as well as all pertinent facts known to the claimant that had a bearing on the damage (such as location, time, roadway conditions, equipment involved, names of personnel, traffic control, etc.) Generally, the more complete the information is that the claimant provides, the better chance the claimant has for recovery if the Contractor is, in fact, liable. (See "Documenting Motor Vehicle Accident Information" on page 13 for motor vehicle accidents. See subsection 107.19 concerning claims against the State.)

Railroad Protective Liability Insurance

A railroad protective liability policy is required by each prime Contractor who performs work on highway projects in which a railroad is involved. The requirements are different for different railroads and are spelled out in the contract special provisions. (See Exhibit 107.10-1.)

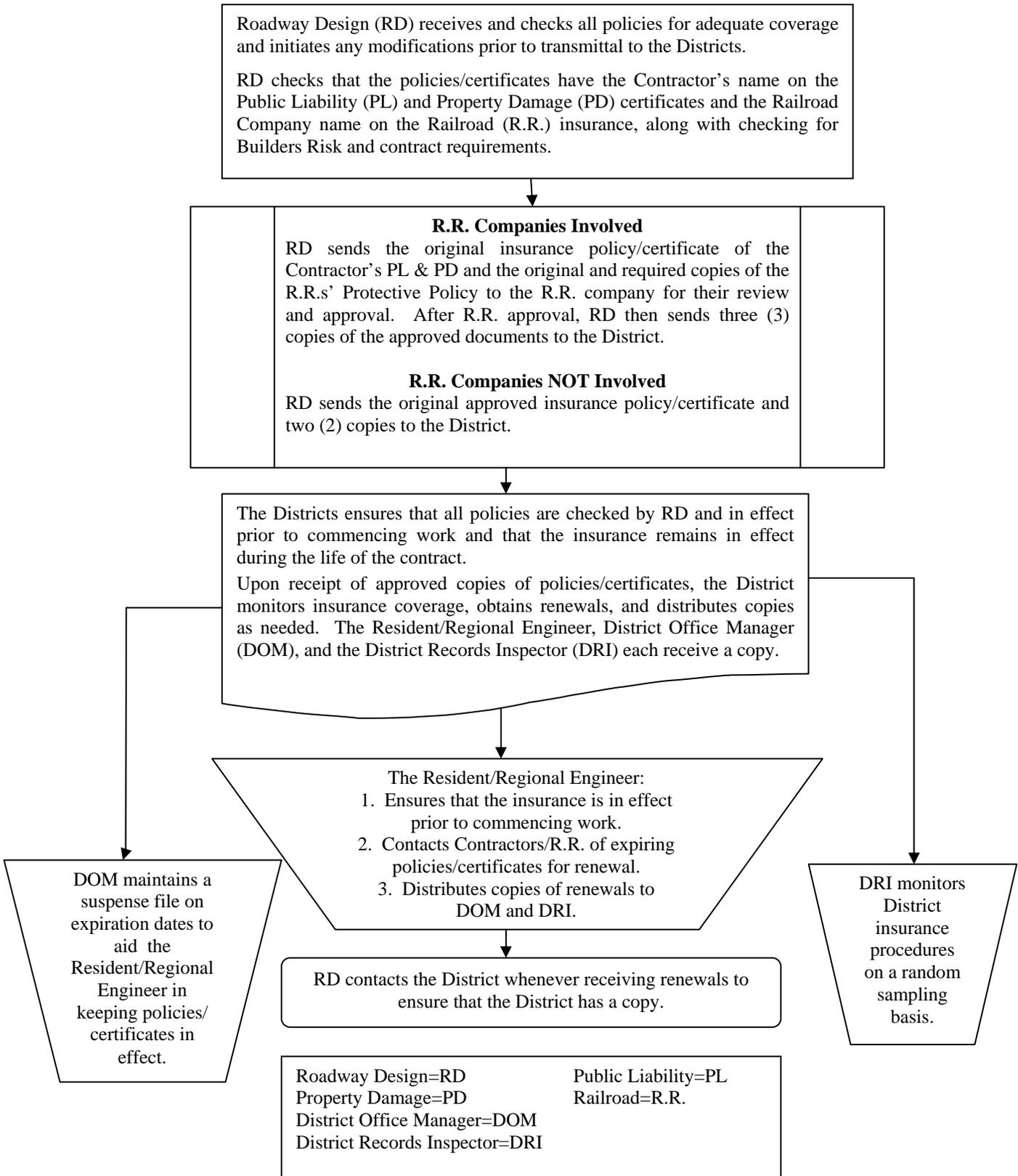
The Contractor must furnish and keep current, for the duration of that portion of a project on or about railroad property, a railroad policy or policies in favor of the railroad that covers damages arising out of injury to or destruction of railroad property. The Contractor may not start work on that portion of the project until after the railroad company approves these policies. Modifications may be made during the time work is progressing.

A reliable insurer authorized to do business in the State of Idaho shall issue each policy.

- a. Prior to the commencement of work on or about railroad property, the Contractor will obtain and furnish an acceptable railroad protective liability policy to Roadway Design. Roadways Design will forward the information to the railroad for approval. Approval may be in some cases by certificate pending issuance of policies.
- b. After approval by the railroad, one certified copy will be sent to the District to be filed in the project file as part of the contract documents.
- c. An extension of the policy is handled the same as a new policy. Questions on railroad protective liability should be referred to the Roadway Design section.

HANDLING INSURANCE REQUIREMENTS ON PROJECTS

The following chart is intended to provide guidelines for processing and monitoring contract-required insurance policies.



Obtaining Motor Vehicle Accident Information

Prior to beginning any work on a roadway project, the Resident/Regional Engineer should write a letter to the Idaho State Police and local law enforcement agencies requesting timely information on any vehicular accidents that have occurred or may occur in the project area. This information is necessary for the following reasons:

- a. Accident information may reveal a problem associated with safety of the roadway or current traffic control that would otherwise go undetected.
- b. Accident information will be needed for the final traffic control report. (See Section 626.)
- c. The department is obligated by FHWA order to provide immediate information on any vehicular accident on construction projects that result in incapacitating injuries or fatalities. The Resident/Regional Engineer shall call this accident information in to the Construction section as soon as possible following any accident that results in death or injuries severe enough that the victims need assistance to leave the accident scene (Class A injuries). Accident information that is required for the telephone contact shall be the number of deaths, number of injuries (Class A), number of vehicles involved, date, time of day, and location. The Construction section will then forward this information to the appropriate FHWA representative.

Police investigated accidents and minor accidents that are not police investigated should be recorded whenever available as Motor Vehicle Accident Information.

Documenting Motor Vehicle Accident Information

Occasionally, state employees witness or come upon motor vehicle accidents that occur on the state highway system, or vehicle accidents sometimes occur within the limits of a construction or maintenance project involving persons other than employees of the state or its contracting agencies.

Motor Vehicle Accident Documentation

Whenever an ITD employee witnesses or comes upon a motor vehicle accident, a record shall be made in their diary of the date, time, highway route, and milepost. The weather condition, general condition of the travel way, and a short narrative description of how the accident happened should be included. Any assistance rendered by the employee to the accident victim such as first aid, calling of police, ambulance, etc., should be recorded. Brief sketches may be desirable to help explain the accident and can be made and attached to the diary entry page. A copy of the information shall be sent to the District EEO/Safety/Training Coordinator.

Additionally,

- a. When an accident occurs on a construction or maintenance project and damage is **minor** with no injuries, the accident should be reported on an ITD-1746, Tort Claim Data Form.

- b. If the accident is of a **serious** nature (considerable property damage, injury, or fatality), then the report shall be made on ITD-645, Traffic Accident Field Report. Sketches, diagrams, and photographs should show the general layout of the accident scene, location and distance of traffic control devices, and any other data relevant to the accident.
- c. Accidents that occur on a project, but are **not witnessed**, also require that all known facts and data be recorded as a diary entry.

The supervisor in charge of the project or highway should review the reports and ensure that the accident is properly documented and made a permanent part of the project records or diary. The appropriate Contractor's personnel shall be notified. When an accident occurs on a state forces project, the appropriate District Engineer and District EEO/Safety/Training Coordinator shall be notified.

The District EEO/Safety/Training Coordinator will send copies of all reports, photos, and diagrams of accidents to the department's Employee Safety/Risk Manager for information and coordination with the appropriate headquarters' section

107.17 ENVIRONMENTAL PROTECTION

The rules and regulations for the control of air pollution, stream protection, and stormwater runoff must be complied with in accordance with ITD Highway Specifications Section 107. The Resident/Regional Engineer shall ensure compliance with the regulations. The District, headquarters Construction section, and other agencies should be consulted for assistance on compliance problems. The Resident/Regional Engineer should have a copy of the environmental documents in their files.

Air Pollution - Potential Problem Areas

- No hot plant or rock crusher shall be allowed to operate without a permit from the Idaho Division of Environmental Quality (DEQ). Additionally, any hot plant manufactured or modified after June 11, 1973 shall comply with all applicable federal new source performance standards (40 CFR 60).
- No hot mix plant shall be allowed to operate that is not equipped with an efficient fugitive dust control system. The control system shall be operated and maintained in such a manner as to satisfactorily control dust emissions from any point other than the hot mix plant stack.
- The hot plant shall not be allowed to start up or operate without equipment capable of complying with DEQ regulations.
- Dust at the hot plant premises (haul roads, aggregate stockpiles, transfer points, aprons, etc.) must be contained by water spraying or other satisfactory means and shall comply with DEQ requirements for the control of fugitive dust.
- The open burning of materials may only be conducted in accordance with DEQ regulations. When burning creates air pollution or a public nuisance, additional restrictions may be imposed to minimize the effect upon the environment.
- All hot plant and rock crushing equipment shall be registered with DEQ at least ten (10) days prior to relocation, using forms available from DEQ.

- All reasonable precautions shall be taken to prevent dust from becoming airborne. Dust is usually controlled by spraying water on material traveling on crusher conveyor belts, material stored in aggregate stockpiles, around the plant site, and to and from the plant site. Dust control measures must comply with DEQ requirements for the control of fugitive dust.

Underground Containers

Underground storage containers (UST) encountered during construction that are not indicated for removal under the contract are not to be excavated, opened, or removed without written approval. Upon the discovery of a previously unidentified UST, the Resident/Regional Engineer will notify the appropriate District personnel as determined by the District Engineer. The discovery of the UST and notification is to get the District Environmental Planner and the UST Coordinator involved as soon as possible to allow proper testing, permit applications, and removal in accordance with the law and to minimize the delay of project construction.

The District Engineer, through the Environmental Planner, will notify the headquarters Environmental section and the Division of Environmental Quality (DEQ) field office. The UST Coordinator will notify the Maintenance Engineer and the local fire department that has jurisdiction.

DO NOT ATTEMPT TO OPEN OR REMOVE THE CONTAINER of any newly discovered UST's, drums, or other containers that may have material inside them (liquid or solid). Opening of containers and sampling can be hazardous due to chemical exposure, explosion, or fire potential. Therefore, trained experts will be used to perform this task. District or construction Contractor personnel **will not** do this work.

Departmental guidance contained in the Design Manual, Hazardous Material/Waste Section, requires the removal and rendering unusable of all UST's discovered during construction. UST removal shall be accomplished in accordance with state law, utilizing a professional UST remover. The appropriate agencies (DEQ, fire department, etc.) will be notified and all required permits should be obtained prior to removal.

Department of Water Resource and Corps of Engineers Permits

The Department of Water Resource Stream Alteration Permit is required for construction in perennial streams. A Corps of Engineers 404 permit is required for the discharge of dredged or fill materials into waters (including wetlands) of the U.S.

The Resident/Regional Engineer shall select, and obtain the headquarters Environmental Manager's approval, an environmental inspector for each highway construction project that requires a 404 CWA Permit. The environmental inspector will ensure the Contractor's compliance with environmental laws and report to the Resident/Regional Engineer on any problems related to erosion/sediment control or wetlands issues on the project. The environment inspector shall report to the headquarters Environmental Manager if issues are not rectified in accordance with permit requirements.

The permits are typically obtained during project development and frequently contain restrictions to the Contractor's operations. Typical restrictions are limitations as to the time of year that construction can occur in the affected waterway, and limitations as to quantities of fill material that can be placed in the waterway. Frequently, the permits are based on one approved method of construction.

If, after contract award, the Contractor elects to use alternative operations that are not covered by the 404 or Stream Alteration Permits, the Contractor must acquire an amendment to the existing permits, or obtain new permits. Construction in the waterway cannot begin until permits are issued which cover the anticipated operations.

NPDES Construction General Permit

The Environmental Protection Agency's (EPA's) National Pollutant Discharge Elimination System (NPDES) Program regulates stormwater runoff from construction sites. Stormwater runoff from construction activities can have a significant impact on water quality, as it carries sediment and other pollutants exposed at construction sites to surface waters of the United States.

EPA's Construction General Permit applies to the State of Idaho. A copy of the EPA's Construction General Permit may be downloaded from www.epa.gov/npdes/stormwater. The State of Idaho's permit number is IDR100000. This permit outlines a set of provisions that must be followed to comply with the requirements of the NPDES storm water regulations.

The EPA Construction General Permit authorizes stormwater discharges from:

- 1) *“Construction activities that result in a total land disturbance of equal to or greater than one acre, where those discharges enter surface waters of the United States or a municipal separate storm sewer system leading to surface waters of the United States; and*
- 2) *Any other construction activity designated by EPA where EPA makes that designation based on the potential for contribution to an excursion of a water quality standard or for significant contribution of pollutant to waters of the United States.”*

The goal of the permit is to reduce or eliminate storm water pollution from construction activity by requiring the planning, implementation and maintenance of appropriate erosion and sediment control practices to protect water quality.

The NPDES general construction permit applies when a project meets the following three criteria:

1. There is ground disturbance such as grading, clearing and grubbing, and excavation.
2. The area of ground disturbance exceeds one acre (.04 hectares).
3. There is a point discharge to waters of the U.S.

The NPDES permit requires preparation of a Storm Water Pollution Prevention (SWPP) plan. The Department develops a conceptual SWPP plan during project development which is then inserted into the project proposal. SWPP plans are site specific plans showing such items as drainage areas, ground disturbance areas, and erosion and sediment control measures. Once the contract is awarded, the SWPP plan is finalized by the Contractor to reflect the Contractor's operations. The Department, the Contractor, and all affected subcontractors must agree to and sign the SWPP plan.

In addition, the Contractor and the Department must complete and submit separate Notices of Intent (NOI) to the EPA. No ground disturbing activities are allowed until the NOI is posted on the EPA web site and seven days have elapsed after posting.

After the project is stabilized (i.e. temporary measures are removed or scheduled for removal and permanent measures are in place), the Department and the Contractor submit separate notices of termination (NOT) to the EPA.

All measures identified in the SWPP plan must be installed and maintained in effective operating condition. Sections 1.5 and Section 1.7 of the Erosion and Sediment Controls manual outlines the Residency/Region’s responsibilities during construction for assuring the measures remain effective.

Potential Problem Areas

Material Sites	Material sites are not exempt from NPDES requirements.
Asphalt plants	Asphalt plants are not covered under the General Permit. If point discharges occur to waters of the U.S., an individual NPDES permit must be obtained.
Construction Changes	The SWPP plan must be revised if the Contractor's operations change from those upon which the original SWPP plan was prepared.
Maintenance	Performance of erosion and sediment control measures devices must be inspected for compliance each week and deficiencies corrected immediately..
NOI Filing	Ground disturbing construction activities cannot begin until seven calendars after EPA posts the NOI on their website.
Consent Decrees	The requirements of these agreements are legally binding and must be followed to avoid penalties.

107.20 FILING TORT CLAIMS AGAINST THE STATE OF IDAHO

Throughout the term of an active contract, the Contractor's public liability and property damage insurance protect the State. Situations, however, may occur in connection with contracted projects during work suspensions or following partial or final acceptance or wherein no action or negligence on the part of the Contractor is involved which may make the State liable for damage incurred by the public. For example: The State may be liable for a seal coat project following the Contractor's period of maintenance responsibility when a loose chip problem is improperly signed and broken windshields result.

Any problem that may affect the public should be reported immediately to the District Engineer and the Employee Safety/Risk Management section. Staff must be able to advise the public on filing of tort claims against the State.

The proper procedure for filing a claim against the State of Idaho is set forth by Idaho Code 6-905 of the Idaho Tort Claims Act and states that "All claims against the State...shall be presented to and filed with the Secretary of State within 180 days from the date the claim arose or reasonably should have been discovered..." Thus under the Idaho Tort Claims Act, the only office eligible to receive a claim is the Office of the Secretary of State, however, a claimant does have several other manners to make a claim against the State. The following are recommended approaches in handling three (3) of the more common situations:

- a) A citizen approaches an agency or employee of the State requesting information on filing a claim against the State of Idaho. The recommended procedure is to advise the claimant of their requirement to file a claim with the Secretary of State giving the details of the claim (as outlined in Idaho Code 6-907) and to submit the claim within the 180 days (as required by Idaho Code 6-905). The District EEO/Safety/Training Coordinators have a supply of the ITD-2326, Citizen's Claim Procedure that can be given to the claimant.
- b) A claimant personally presents a written notice of claim to an ITD employee. The written claim should be refused and advice given of the proper procedures for making a claim against the State of Idaho as outlined above.
- c) A claim or what could reasonably be interpreted as a claim is received by mail. The recommended procedure is to immediately return the claim to the claimant along with a copy of the ITD-2326, Citizen's Claim Procedure Form or a letter explaining the filing procedure. .

Any claim against the State that is received by ITD must be **immediately returned**.
ITD cannot file the claim on the behalf of the claimant.

When notified of an alleged incident, an investigation will be conducted and reported on either the ITD-90, Traffic Accident Field Report, or the ITD-1746, Tort Claim Data for Risk Management and sent to the District EEO/Safety/Training Coordinator. The District EEO/Safety/Training Coordinator will keep a copy and forward the report to the headquarters' Employee Safety/Risk Manager. *All incidents of possible tort claims must be reported at the time they occur, or external insurance carriers could refuse responsibility for coverage.*

Any questions concerning the filing of tort claims should be referred to the headquarters' Employee Safety/Risk Manager.

107.22 PUBLIC INFORMATION MEETINGS

A number of ITD construction projects, particularly those in urban areas, have a contractual requirement for the Contractor to arrange for periodic public information meetings. The public information meeting is held to keep those impacted by the project apprised of upcoming activities that may affect their access and to receive input from the public that could lessen the effect of construction activities. The public information meetings are a form of “partnering” with the public and have been very effective.

The Public Involvement Coordinator (PIC) has been charged with coordination of all meetings with the public involving the department. The PIC does not need to actually organize, conduct, or even participate in all meetings, but rather be informed of the meetings and assist when requested. The PIC is knowledgeable in effective meeting methods, preparation of news releases, etc., and can address lead-time and other requirements that are necessary for conducting appropriate public meetings.

The Resident/Regional Engineer should notify the PIC of any contracts where public information meetings are involved. The PIC should be invited to preconstruction conferences to discuss and assist in planning the meetings or a separate meeting can be arranged involving the PIC, Resident/Regional Engineer, and the Contractor. The PIC, Resident/Regional Engineer, and Contractor should all strive for a unified approach to properly respond to management or public inquiries concerning the meetings.

Additional guidelines and references for public hearings/meetings are outlined in Administrative Policies A-20-03, Public Hearings, and A-20-04, Public Hearing Officers. The Public Involvement Officer has additional information about the conduct of Public Involvement initiatives.

113.00 CONTRACT CIVIL RIGHTS**General**

Receipt of federal aid (FA) funds is contingent on implementing and monitoring for compliance several Civil Rights (CR) programs in the Department. Three of the five CR programs--the Contract Compliance Program, the Training Special Provisions (TSP) Program, and the Disadvantaged Business Enterprise (DBE) Program--require that FA construction contracts contain special provisions stipulating that Contractors provide equal employment opportunity (EEO).

Included in this is:

- Providing equal opportunity for the employment of minorities and women in the crafts utilized on the project (Contract Compliance Program).
- Providing equal opportunity and taking affirmative action steps in the employment of minority and women trainees in the crafts utilized on the project (TSP Program).
- Providing Good Faith Efforts in subcontracting a portion of the work to certified minority or women-owned businesses (DBE Program).
- Providing employment rights for Native Americans including the Tribal Employment Rights Ordinances, if applicable (TERO program).

The following information is to be used as a supplement and guide for construction personnel in administering the "Civil Rights Special Provisions" and "Training Special Provisions" of federal aid contracts. An explanation of these programs is contained in the EEO Contract Compliance Plan and the Disadvantaged Business Enterprise Plan, along with listings of authorities under which the programs are implemented and responsibilities of other Department personnel.

Construction personnel should refer to the EEO Contract Compliance Plan and the Disadvantaged Business Enterprise Plan for detail of actions to be taken when not specifically outlined within this supplemental guide. The plans may be found on the EEO office intranet home page.

113.01 PRECONSTRUCTION MEETINGS

The Resident/Regional Engineer (RE) or the District EEO/ST Coordinator presents the Contractor at the preconstruction conference with a package containing:

- A. All federally required job site posters. (List can be obtained from EEO/ST or ITD Headquarters EEO Office)
- B. Form FHWA-1391, "Federal-aid Highway Construction Contractors Annual EEO Report". See Exhibit 113-3A.

The basic elements of the Civil Rights Special Provisions to be emphasized at the preconstruction meeting have been extracted from the information that follows and placed in the Preconstruction Conference Outline located in Section 108.04 of this manual. The RE or the EEO/ST Coordinator is responsible for ensuring that the Contractor understands the commitments made when the contract was executed, and the consequences of failing to carry out those commitments. In order to have a more detailed understanding of the Civil Rights Special Provisions the RE and the EEO/ST Coordinator should refer to the EEO Contract Compliance Plan and the DBE Plan.

113.02 CONTRACT COMPLIANCE PROVISIONS

General

Sections I, II, and III of the Civil Rights Special Provisions contain the commitments made by the Contractor to provide equal employment opportunity and practice affirmative action in hiring, training, and promoting women and minorities in the crafts and in their subcontracting opportunities. As with any other provision in the contract, the RE is responsible for monitoring, administering, and obtaining compliance with the “Civil Rights Special Provisions”.

The Contractor agrees to take the following action on the project:

- A. Prohibit discrimination based on race, sex, color, national origin, age, disability, or religion.
- B. Develop and post an Equal Employment Opportunity (EEO) policy statement which expresses the company’s commitment to affirmative action and equal employment opportunity. All Subcontractors must also develop, and post their policies.
- C. Display the Federally required posters, in a convenient, suitable place, readily accessible by employees and potential applicants.
- D. Designate by letter, before beginning any on-site work, an Equal Opportunity Officer who has the authority, position and experience to carry out an effective EEO program as the Project EEO Officer and make his/her identity known to all supervisors and employees. This letter must be placed in project files.
- E. Provide to the RE written verification that supervisors and employees have been advised of the company’s EEO Policy before starting the project. This documentation must be placed in the project files.
- F. Take affirmative actions to meet the goals for minority and female employment as specified in the Civil Rights Special Provisions. These goals are developed and enforced by the U.S. Department of Labor.
- G. Maintain employment records in a format that identifies employees by race, sex, craft and work status and the hours worked within each craft and apprentice/trainee level, if appropriate.
- H. Include in all subcontracts over \$10,000 the same Civil Rights Special Provisions as contained the Prime’s contract.

- I. Submit employment data reports (FHWA-1391) each July on all work performed under the contract by the Contractor and/or any covered Subcontractor.

On-Site Inspections Form ITD 2674

After each project is under way and the Contractor has employed at least two-thirds of the anticipated work force, the RE conducts on-site inspections and records the findings on Form ITD-2674.

If the RE finds minor items (e.g. EEO policy not posted), the RE requests that the Contractor take corrective action immediately. If the Contractor refuses or neglects to take the corrective action, the RE should request a Compliance Review by the EEO Contract Compliance Officer (CCO). Copies of all on-site inspections must be forwarded to the CCO.

- A. On-site inspections for EEO requirements will be conducted on:
 - All Prime Contractors.
 - All Subcontractors with subcontracts of \$10,000 or more.
- B. The RE will complete the On-Site Inspection Form (Form ITD-2674) and distribute as indicated on the form. EEO on-site inspections determine whether the Contractor is meeting the basic intent of the Civil Rights Special Provisions in the contract. It can serve as a reminder to Contractors (who usually focus on completing the project) that ITD is also concerned about who is working on the project, and the environment in which they work.

In addition to routine contract monitoring by the RE, District EEO/ST Coordinators will randomly select current projects to determine:

- Whether the project file contains an ITD-2674 for the Prime and each Subcontractor that has been on the project.
- Whether the information provided on the ITD-2674 completed by the RE (or the RE's designee) correlates with the EEO/ST Coordinator's independently conducted investigation.

The EEO/ST Coordinators report their findings to the District Engineer (DE). Copies of all on-site inspections must be forwarded to the Contract Compliance Officer. In order to have a more detailed understanding of what is being monitored by the On-Site Inspection the RE and the EEO/ST Coordinator should refer to the EEO Contract Compliance Plan.

Contract Compliance Review

Each calendar year, Headquarters personnel (Civil Rights, Construction, Design) and District personnel coordinate selection of contracts for formal Compliance Reviews for the following construction season according to criteria established in the Contract Compliance Plan. The CCO advises Districts of those projects and contractors selected.

EEO/ST Coordinators, with the assistance of the Resident\Regional Engineer, should monitor employment trends as indicated on payrolls to determine the best time for conducting the review. Reviews should take place if possible after the Contractor has had hiring opportunities. The EEO/ST Coordinators or designated DRIs will schedule the review dates in coordination with the CCO, District personnel and the Contractor.

While the CCO is ultimately responsible for conducting the review, the District EEO/ST Coordinators or designated DRIs are responsible for initiating the review process, preliminary analysis of the documentation submitted, and preparation and distribution of all related letters and forms. The Contract Compliance Officer, representatives of FHWA, and appropriate District staff may accompany the District EEO/ST Coordinators or designated DRIs in the on-site portion of the review (i.e. evaluation of the job site and employee interviews).

At the conclusion of the review, an On-Site Conference is conducted with the Contractor's representatives to discuss the preliminary findings. The Contract Compliance Officer will conduct the On-Site Conference. Others attending the On-Site Conference will be the EEO/ST Coordinator or designated District Records Inspectors (DRIs), representatives of FHWA, appropriate District staff and the Contractor's representatives. The EEO/ST Coordinators or designated DRI's may be requested to conduct the On-Site Conference by the CCO or the EEO Manager (EEOM) if needed. FHWA representatives attending the On-Site Conference may ask questions regarding any aspect of the compliance review. The RE and other appropriate project personnel will attend this conference to assist in clarifying issues or documentation and to become familiar with additional requirements which may be placed on the Contractor if found to be out of compliance or deficient in some manner. For more detail on contract compliance reviews, refer to the Contract Compliance Plan.

Complaints

The Idaho Transportation Department is committed to thoroughly and promptly investigating each complaint in a confidential manner employing a process that treats all parties involved with respect. Contractors who are found to have discriminated shall be deemed in noncompliance with the EEO contract requirements and shall be required to promptly take corrective action or be subject to contract sanctions.

Individuals who are eligible to file complaints include all employees and applicants of any prime and/or subcontractor possessing ITD federal and/or state contracts. Any employee of a contractor working on an ITD contract who believes they have been sexually harassed or discriminated against in their employment on the basis of race, color, national origin, religion, age, disability or sex may file a complaint. A complaint is filed by submitting a written statement outlining the basis of the complaint to the ITD's CCO or to any of ITD's six District EEO/ST Coordinators. The complaint must be filed no later than 180 days of the alleged event(s). A copy of these procedures as detailed in the ITD EEO Contract Compliance Plan shall be provided upon request.

Retaliatory actions are prohibited against a person(s) who has filed a complaint, testified, or in any way participated in reporting alleged discriminatory practices. The contractor/Respondent shall be advised that such retaliation and, if substantiated, shall constitute a violation of the EEO requirements of the contract and is subject to a finding of noncompliance and/or sanctions.

When a complaint is filed with ITD, against a contractor, regarding sexual harassment or discrimination based on race, color, national origin, religion, age, disability or sex, the RE notifies the District EEO/ST Coordinator or designated DRI and the EEOM. The EEOM notifies the Federal Highway Administration including a list of federal aid contracts the Contractor holds in Idaho and the value and location of each. At a minimum, the following information is compiled by the District EEO/ST Coordinator or designated DRI and included in each report of discrimination:

- Name, address and telephone of the complainant.
- Contractor involved and location where the complaint originated (project site, home office, etc.).
- Basis of complaint (i.e. race, color, religion, sex, national origin, age, and disability).
- Date(s) of alleged discriminatory act(s). (Complaints must be filed within 180 days of the last alleged discriminatory act.)
- Date complaint was received.
- A statement of the complaint and issues involved signed by the complainant.

The EEOM will assign an Investigator trained in performing Civil Rights fact-finding investigations who will promptly investigate each alleged act of discrimination. This investigation will be coordinated by the EEO Office to assure the necessary information is gathered and report to the EEOM. The EEOM will keep the Chief Engineer and the District Engineer informed of the status of the complaint during the investigation.

Based on the facts obtained in the investigator's report, the EEOM will determine if discrimination has or has not taken place. The EEOM will prepare an Investigative Summary and Recommendation Report showing the conclusions and recommendation and present the report to the Chief Engineer and the Administrative Services Division Administrator. The Administrative Services Division Administrator will review the report on the investigation and make a final determination of ITD's decision. The EEOM will prepare a Statement of the Department's Decision reflecting ITD's final determination.

The EEOM will inform the complainant and the respondent of the department's decision, in writing, and their right to appeal.

The EEOM will send copies of the complaint, Investigative Summary and Recommendations Report, and Statement of Agency Decision to FHWA within 60 days of receipt of the complaint.

When discrimination is determined, a "30-Day Show Cause Notice" will be issued and the Contractor will be required to take appropriate corrective or disciplinary action to eliminate the discrimination and/or correct inappropriate behavior, plus develop a Corrective Action Plan. If the Contractor fails to take the required steps identified, a formal hearing will be held as outlined in the EEO Contract Compliance Plan Section III Contract Sanctions.

113.03 DISADVANTAGED BUSINESS ENTERPRISE (DBE)**General**

Part III of the "Civil Rights Special Provisions" contains the Contractor's commitment to ensure that Disadvantaged Business Enterprises (minority, woman, or otherwise disadvantaged-owned firms) have equal opportunity to participate in performance of the contract. If a goal is included in the contract the Contractor commits to making good faith efforts to seek out and consider DBE firms for work on the project.

Establishing Contract Goals

The Roadway Design Section and the EEO Office will review proposed projects to identify work that could be performed by DBEs and determine if a goal should be established. Items considered in establishing contract requirements include, but are not limited to the following:

- Project size, duration, and dollar value
- Number and size of contractible items in relation to DBE firms available to do the work
- Nature of the project
- Project location

DBE goals if established, are placed in "Notices to Contractors" and subsequent contract specifications.

Award of Contract

- A. The apparent successful bidder is the lowest qualified and responsible bidder who certifies that the firm will "perform the work" of the contract "in accordance with" various regulations and special provisions of the contract, including the Civil Rights Special Provisions.
- B. Within fifteen (15) days of receipt of the "Intent to Award" letter, the apparent low-bid Contractor must submit the names of all solicited Subcontractors, equipment lessors, manufacturers, delivery companies and suppliers on form ITD-2396, "DBE Commitments." The form must contain the following information:
 - Names of DBE and non-DBE firms contacted, or who volunteered quotations;
 - Description of the work that each DBE and non-DBE offered to perform;
 - Dollar amount of the work each DBE and non-DBE offered to perform;
 - Identification of DBE firms and non-DBE firms that the contractor intends to use in the execution of this contract. A YES entry in the "Commit to Use" column after a DBE firm constitutes a commitment to use that firm for the work items listed;

- Dollar amount of the participation of each DBE firm to be utilized and total DBE dollar participation anticipated;
- Signed commitment to use the DBE subcontractor(s) identified on the form – for the contract items specified – to meet the contract goal;
- Signed confirmation from the DBE(s) on the DBE(s) company letterhead stating that they are participating in the contract as specified in the prime contractor's commitment; and
- Documentation of good faith efforts if the goal cannot be met.

The information is evaluated by the CCO to determine whether the commitment meets the terms of the contract requirements and the DBE program and goals. Failure of the Contractor to submit DBE information accurately and in proper form may render the bid nonresponsive.

The apparent low bidder's commitment to meet the goals (or demonstration of good faith efforts) determines whether the contract will be awarded. If the Contractor commits to the use of DBEs, which meet or exceed the established goal, the Good Faith Effort Section on pages 5 and 6 of form ITD-2396 need not be filled out.

C. If the apparent low bidder is unable to identify DBE Subcontractors in order to meet or exceed the goal, the bidder must document and submit justification of a "Good Faith Effort" on pages 5 and 6 of the ITD 2396 DBE Commitment form as to why the DBE goal could not be met. The CCO will review the documentation prior to award of the contract to determine if all of the good faith effort steps have been accomplished. To demonstrate good faith efforts, the bidder must document the steps taken to obtain DBE participation. As stated in the Civil Rights Special Provisions, this information should include, but is not limited to:

- Whether the Contractor advertised in general circulation, trade association, and minority-focus media concerning the subcontracting opportunities;
- Whether the Contractor provided written notice to a reasonable number of specific DBEs that their interest in the contract was being solicited, in sufficient time to allow the DBEs to participate effectively;
- Whether the Contractor followed up initial solicitations of interest by contacting DBEs to determine with certainty whether the DBEs were interested;
- Whether the Contractor selected portions of the work to be performed by DBEs in order to increase the likelihood of meeting the DBE goals (including, where appropriate, breaking down contracts into economically feasible units to facilitate DBE participation);

- Whether the Contractor provided interested DBEs with adequate information about the plans, specifications and requirements of the contract;
- Whether the Contractor **negotiated** in good faith with interested DBEs, not rejecting DBEs as unqualified without sound reasons based on a thorough investigation of their capabilities;

NOTE: ITD defines the term "negotiate," as it relates to "DBE good-faith efforts," to mean that the Contractor will engage in discussions with DBEs related to:

- The content of bid items and possible adjustments thereto;
- The bid items to be included in a package and possible adjustments thereto;
- The terms and conditions of the subcontract, and possible adjustments thereto;
- Whether the Contractor made efforts to assist interested DBEs in obtaining bonding, lines of credit, or insurance required by the ITD or Contractor;
-
- Whether the Contractor made efforts to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services;
- Whether the Contractor used the services of available minority community organizations; minority Contractors' groups; local, state and federal minority business assistance offices; and other organizations that provide assistance in the recruitment and placement of DBEs; and
- Whether the Contractor was involved in any pre-solicitation or pre-bid meetings that were scheduled to inform DBEs of contracting and subcontracting opportunities.
- Whether any other actions were taken to meet the goal.

If the bidder to whom ITD proposes to award the contract fails to meet the DBE goal and is unable to demonstrate good-faith efforts, or efforts cannot be verified, that bidder may not be awarded the contract and may forfeit the proposal guarantee submitted with the bid. (Standard Specifications 103.06) The CCO, EEOM, and RDE will confer with the Chief Engineer to evaluate the information and determine disposition of the bid.

The apparent successful bidder's certification in the bid proposal indicating the DBE goal will be met or exceeded (or perform all good-faith efforts) is considered binding. Failure to abide by commitments in the certification may result in;

Withheld payments;

Suspending the contract in whole or in part until the Contractor is found to be in compliance (no progress payment will be made during the time and no time extension will be made);

Termination of the contract; and/or

Assessment of liquidated damages. (Contract Civil Rights Special Provisions)

Good Faith Efforts when Replacing DBES

Contractors cannot terminate a DBE Subcontractor (either for their convenience or to replace a defaulting DBE) that has been selected in the ITD-2396 without the written consent of the RE. A DBE may only be replaced if the DBE is **unwilling or unable to perform**. The steps below must be followed for replacement.

1. The contractor notifies the RE. The RE forwards the request to the CCO with recommendation for approval or denial. The CCO then requests written release from the defaulting DBE and then notifies the RE on whether the commitment is or is not terminated.
2. The Contractor must replace the defaulting DBE with another DBE to the extent needed to meet the contract goal, or make and document good faith efforts (listed above) to do so.
3. The Contractor must obtain the approval of substitute DBE(s) from the RE and the CCO before signing and submitting copies of the revised or new subcontracts.
4. If the Contractor is unable to obtain substitute DBEs, he must submit documentation of good faith efforts (listed above) in soliciting substitute DBEs to complete the unfinished work, or break out other contract items to subcontract. ITD may waive or adjust the goal as appropriate, depending on the project circumstances.

Counting DBE Participation toward Contract Goals

1. Only the value of the work actually **performed by and paid to** DBEs is creditable toward the DBE goal, including the cost of supplies and materials obtained by the DBE for work on the contract (except supplies and equipment purchases or leases from the Prime Contractor or their affiliate).
2. When a DBE that subcontracts part of the work of their contract to another firm, the value of the subcontracted work may be counted towards the DBE goals only if the DBE's subcontractor is also a DBE.
3. The DBE Plan and the Civil Rights Special Provisions state that credit toward meeting the contract goal varies with the type of function performed by the DBE firm as follows:
 - Joint Ventures between DBE and Non-DBE Firms – That portion of the total dollar value of the contract equal to the distinct, clearly defined portion of the work of the contract that the DBE performs with its own forces toward DBE goals. Joint venture agreements must be approved by the EEOM and the ITD Legal Counsel before contracts are signed. (Information to be submitted with ITD-646-B Information for Determining Joint Venture Eligibility)
 - Professional, Technical, Consultant, or Managerial, Bonding or Financial Services - (provided a determination is made that the fees are reasonable).....100%

- Construction Firms - (supply labor and materials to perform a discrete element of the work).....100%
- Manufacturers - (must operate a factory that produces, on the premises, the materials, supplies, articles or equipment required under the contract and of the general character described in the specifications).....100%
- Regular Dealers - (a firm that owns, operates, or maintains an establishment that regularly sells materials or supplies to the general public).....60%
(NOTE: To be a regular dealer, the firm must be an established business that engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question. A regular dealer in bulk products (petroleum, steel, etc.) does not need to maintain a place of business, but must own and operate distribution equipment for the products. Any supplementing of a dealer's own distribution equipment shall be by a long-term lease agreement)
- Brokers, packagers, manufacturers' representatives - (No credit for materials or suppliers being provided).....Net Fee
- Trucking Firm -
 - Must own and operate at least one fully licensed, insured, and operational truck used on the contract;
 - Will receive credit for total value of transportation services it provides on the contract using trucks it owns, insures, and operates using drivers it employs;
 - May lease trucks from another DBE firm, including an owner/operator who is certified as a DBE and receive credit for the total value of the transportation services; or
 - May lease trucks from a non-DBE firm, including an owner/operator. A DBE who leases trucks from a non-DBE is entitled to credit for the total value of the services provided by the non-DBE firm not to exceed the value of the services provided by the DBE-owned trucks. Additional participation by non-DBE firms receives credit only for fees or commission received.

Example: DBE Firm X uses two of its own trucks on a contract It leases two trucks from DBE Firm Y and six trucks from non-DBE Firm Z. DBE credit would be awarded for the total value of transportation services provided by Firm X and Firm Y, and may also be awarded for the total value of transportation services provided by four of the six trucks provided by Firm Z. In all, full credit would be allowed for the participation of eight trucks. In respect to the other two trucks provided by Firm Z, DBE credit could be awarded only for the fees or commissions pertaining to those trucks Firm X receives as a result of the lease with Firm Z

A lease must indicate that the DBE has exclusive use of and control over the truck being leased. This does not preclude the lease truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE.

When a certified DBE firm a Prime Contractor, the total dollar amount of the actual contract awarded may be counted toward the contract DBE goal attainment.

The Contractor may count toward its DBE goal only those expenditures to certified DBE firms that provide a "Commercially Useful Function" on the project. The DBE performs a "Commercially Useful Function" when it is responsible for execution of a distinct element of the work of a contract and carries out that responsibility by actually performing, managing and supervising the work involved. A subcontracting arrangement, which inflates DBE participation for the sole purpose of meeting contract goals, is not acceptable. A DBE firm acting as a middle person or passive conduit (where the activity is not standard industry practice) is essentially a "broker" and is not performing a Commercially Useful Function.

Second-tier DBE subcontracts (whether with a DBE or non-DBE Subcontractor) may be counted toward the Prime Contractor's DBE goal provided the arrangement is in accordance with standard industry practice. If the first-tier Subcontractor is unable or unwilling to perform for any reason, the Prime Contractor should be prepared to assume responsibility for utilizing the second-tier DBE Contractor if the second-tier DBE Contractor is listed on the ITD-2396 and the Prime Contractor has received credit toward the goal in the amount of the second-tier contract. However, a CUF must be performed.

If all or part of the work committed to a DBE Subcontractor is eliminated from the project, the CCO will determine, on a case-by-case basis whether the Contractor will be required to make up the deficiency of the creditable amount below the contract goal. The CCO's decision will be based on all the circumstances such as the amount of time left in the contract, the availability of DBE firms to do the remaining work, etc.

All subcontracts and second-tier contracts must be approved by the RE before work commences.

DBE Joint Ventures

Minority or women-owned firms that are currently certified as DBEs in Idaho may enter into DBE joint ventures with non-DBEs to participate in highway construction projects. DBE Joint ventures seeking DBE credit are subject to the following requirements.

- Applicants, bidding as Primes, must complete ITD-646b, "Information for Determining Joint Venture Eligibility", and submit it with all accompanying documentation with their bid. DBE joint venture applicants submitting quotes as Subcontractors must complete an ITD-646b, which is submitted to the Prime Contractor. The Prime Contractor will submit the ITD-646b with their ITD-2396 DBE commitment form.
- **The DBE partner of the DBE joint venture must have a separate agreement showing the DBE partner's bid items, who will be supervising work, and dollar participation. The agreement must define the DBE partner's Distinct Elements of Work.**
- The EEOM will examine all information and, in coordination with Legal Counsel, determine whether all requirements have been met and documentation provided. The EEOM will submit the joint findings to the Roadway Design Engineer, along with a recommendation on the advisability of accepting or denying the DBE joint venture arrangement.

- Only that portion of the joint venture directly under the control and management of the participating DBE will be eligible for credit toward the DBE goal and will be identified on ITD-2396, DBE Commitment Form.
- DBE joint venture applications must be submitted and evaluated on a project-by-project basis. Approved joint venture arrangements are project-specific and will cease to exist (for ITD purposes) at the conclusion of the project.

Commercially Useful Function (CUF)

The contract Civil Rights Special Provisions requires that the DBE(s) perform a Commercially Useful Function (CUF) on the project.

ITD will consider that a CUF has been performed when a DBE is responsible for the execution of a distinct element of the work by actually performing, managing, and supervising the work involved in accordance with industry practices (except where such practices are inconsistent with DBE regulations and requirements).

The DBE must be actively performing, managing and supervising the work. As such:

1. The DBE must be responsible for ordering its own materials and supplies, determining quantity and quality, negotiating price, installing (where applicable) and paying for the material itself;
2. The DBE must perform the work commensurate with the amount of its contract;
3. The DBE's contribution cannot be that of an extra participant or a conduit through which funds are passed in order to obtain the appearance of DBE participation;
4. The DBE must exercise responsibility for at least fifty (50) percent of the total cost of its contract with its own workforce;
5. None of the DBE's work can be subcontracted back to the prime contractor, nor can the DBE employ the prime's, or other subcontractor's supervisors currently working on the project;
6. The DBE's labor force must be separate and apart from that of the prime contractor or other subcontractors on the project. Transferring crews between primes, subcontractors, and DBE contractors is not allowed;
7. The DBE owner must hold a Public Works license and any other professional or craft licenses required for the type of work he/she performs on the projects;
8. The DBE may rent or lease, at competitive rates, equipment needed on the project from customary leasing sources or from other subcontractors on the project; and
9. The DBE trucking firm must be responsible for management and supervision of the entire trucking operation for which it is responsible. The following rules also apply to DBE trucking firms:

- a. Must own and operate at least one fully licensed, insured, and operational truck used on the contract. Owner/operators must have an agreement with the contractor or subcontractor that contains;
- Owner/operator's name
 - Social security number
 - Copy of vehicle registration receipt
 - Current vehicle license number
 - Vehicle identification number
 - Method of payment (hour, ton or load)
- b. Leases must indicate that the DBE has exclusive use of and control over the truck, but does not preclude the leased truck from working for others during the term of the lease with consent of the DBE, provided the lease gives the DBE absolute priority for the use of the leased truck.
- c. Leased trucks must display the name and identification number of the DBE.
- d. Lease/rental/contract agreements must be approved by the RE.

Monitoring Compliance

As soon as the DBE Subcontractor commences work on a project, REs will review the DBE's operation based on the work items in the DBE's subcontract and complete ITD-1701, Commercially Useful Function Determination.

1. The RE should be able to distinguish the DBE owners, supervisory personnel and crew members from other personnel on the project to ensure that the DBE is operating in an independent manner.
2. If equipment is leased, the RE should obtain a copy of the lease agreement to determine whether the DBE has exceeded the limits established in the previous section, and to verify that prior approval by the RE was obtained.
3. If the RE determines that the DBE is not performing according to the terms of the contract, i.e., performing a CUF, the RE will notify the Prime Contractor in writing, according to instructions contained in the following section, giving the Prime Contractor five (5) days to eliminate the infraction. This action will be documented under questions 19 and 20 on Form ITD-1701. Copies of the ITD-1701 will be sent to the RE, District EEO/ST Coordinator and the Contract Compliance Officer.
4. If the Prime Contractor fails to remedy the violation, the RE shall impose one or more sanctions and the payments made to the DBE will not be credited towards the Prime Contractor's DBE requirement.
5. If the RE determines that the DBE's performance on the job contains a pattern of relationships with non-minority businesses that bring the DBE's independence and

control, and therefore its eligibility to participate, into question, the RE should advise the Contract Compliance Officer and request that an investigation be performed.

Record Keeping

All records relating to the DBE program shall be maintained by the Prime Contractor and each Subcontractor during the course of the project and preserved for a period of 3 years from the date of completion of the contract.

The Prime Contractor or Subcontractor shall make records pertaining to the DBE program available for inspection, copying or transcription by authorized representatives of the ITD or the FHWA and shall permit such representatives to interview employees as necessary.

Failure to submit the required records upon request, to make such records available, or to permit representatives to interview employees may be grounds for sanctions.

Sanctions

Whenever the RE believes that the Contractor or DBE Subcontractor is not operating in compliance with the terms of Part III, Disadvantaged Business Enterprise Requirements of the Civil Rights Special Provisions (based on an investigation and documentation of the circumstances), the RE will take the following action:

- Advise the Prime Contractor, in writing, of the specific infractions that have been observed and indicate the length of time (not to exceed five working days) that will be allowed in which the Prime Contractor must take corrective action. Further advise the Prime Contractor that all or part of progress payments will be withheld if the deficiencies are not corrected within the specified time period. Withhold payment if not corrected.
- If the Contractor subsequently fails to correct the deficiencies or fails to have the DBE correct the deficiencies, the RE may request direction from the District Engineer and CCO as to appropriate action under the circumstances. After consultation with the EEOM and Legal Counsel, the contract provisions permit the RE to take any of the following actions for any breach of the DBE provisions of the contract:
 - Withhold all or part of progress payments until it is determined the Contractor is in compliance.
 - Suspend the contract, in whole or in part, until the Contractor is found to be in compliance with no progress payment being made during this time, no time extension made and no reimbursement of any additional expenses including field and home office overhead.
 - Cancel or terminate the contract for cause as authorized under Section 108.08 of the Contract Specifications.

Assess against the contractor's final payment on this contract or any progress payments on current or future Idaho Federal-Aid projects an amount equal to the value of the DBE committed work items that were not performed by the committed DBE firm. However, if the failure is the first by the contractor, and ITD determines the failure was an unintentional error or oversight, the amount to be deducted may be reduced to

one-half (1/2) of the value of the un-obtained DBE participation based on the committed work items. In addition to any other sanctions, willful failure of the contractor or a DBE to comply with this contract or with the Federal DBE regulations may result in disqualification from further contracting, subcontracting, or other participation in Idaho Transportation Department projects

Payments to DBE Subcontractors

To ensure that all obligations under contracts awarded to DBEs are met, the RE will review the Contractor's DBE involvement efforts during the performance of the contract. Contractors are required to pay each subcontractor for satisfactory performance of its contract items no later than twenty (20) calendar days from receipt of each payment the Contractor receives from ITD. The Contractor shall return retainage payments to each subcontractor within twenty (20) calendar days after the subcontractor's work is satisfactorily completed. The Contractor shall certify to the RE that payment to each subcontractor has been made on the certification forms provided by ITD.

The RE shall consider that a subcontractor's work is satisfactorily completed in accordance with 49 CFR 26.29, "a subcontractor's work is satisfactorily completed when all the tasks called for in the subcontract have been accomplished and documented."

113.04 TRAINING SPECIAL PROVISIONS (TSP)

General

The primary purpose of the Training Special Provisions Program is to train and upgrade minorities and women toward journey level status in crafts where they are under-represented. The contract specifies the number of training hours to be filled. The Contractor should assign training hours to crafts that are under utilized in minorities or women. Minorities and women in training positions can be counted toward the EEO goals. RE's should encourage Contractors to bring trainees into the work force early in the contract to provide adequate opportunity for trainees apprentices to complete their programs and to reduce the risk of being found in noncompliance with the training special provisions. Prior to commencing construction, the Contractor shall submit to the RE a plan showing how the Contractor will meet the TSP requirements. This plan will include the number of trainees to be trained, the crafts that the training will cover and the training programs to be used. This plan will also show the starting time for the training in each craft.

Establishing Project Training Goals

The Roadway Design Engineer, in coordination with District personnel, and the Contract Compliance Officer, determines which construction contracts will contain Training Special Provisions and the number of training positions that can be accommodated on each project. Before and throughout the construction season, the Roadway Design Engineer and District Design personnel evaluate the potential availability of work under the contracts, the duration of the work (to ensure adequate time for completion of training) and the potential long-term benefits to the trainees. Assignment of training slots to specific contracts is based on:

- Availability of minorities, women and disadvantaged.

- Potential for effective training.
- Duration of the contract.
- Dollar amount of the contract.
- Total normal work force the average bidder is expected to use.
- Geographic location.
- Type of work.
- Need for additional journeymen in the area.
- Total training hours established and committed to FHWA.
- Ratio of journeymen to trainees during normal operations.

If it is determined that the crafts on a project are not under represented by minorities or women, then training requirements will be removed from the contract.

Placing Trainees

The Contractor may use either Department of Labor or ITD/FHWA-approved programs to be eligible for reimbursement at the rate of \$.80 per hour under the TSP Program. Other programs may be submitted for approval by DOL or ITD/FHWA but, must be approved prior to the start of the training on the project. **Trainees or apprentices and their training programs must be approved by the RE before the trainees start work and the Contractor is eligible for reimbursement.** (RE's may refer to the EEO Contract Compliance Plan for further detail in this process.)

Prime Contractors may request additional training hours or may relinquish training requirements to Subcontractors. However, if the positions are relinquished to a Subcontractor, minority/women trainees in those positions cannot be counted toward the minority/women goals of the Prime Contractor - only toward the goals of the Subcontractor. Also, the Prime Contractor remains responsible for the TSP requirements being met.

The order of priority for filling training positions is as follows:

- Minorities and women receive first priority.
- Disadvantaged persons, as defined by the DOL (see Exhibit D of the EEO Contract Compliance Plan).
- Nondisadvantaged Caucasian males. The Contractor is allowed to accept nondisadvantaged Caucasian males into the TSP Program, only after the Contractor has made and documented a good faith effort to hire minorities, women, and the disadvantaged.

Contract provisions require that Contractors submit name, Social Security number, craft, ethnicity and sex of all proposed trainees along with copies of their training programs for approval by the RE. A copy of this information is also furnished to the EEO/ST Coordinator or designed DRI. **(Information is required prior to the trainee starting work. No hours can be counted towards the TSP requirements until information is received.)**

When using ITD/FHWA, or Contractor programs, the above information is provided by using the ITD-2777 "On the Job Training Agreement." The Contractor must identify trainees/apprentices on payrolls by race, sex, crafts, status within the program and other relevant information, which may be requested.

Contractors may utilize programs approved by the U. S. Department of Labor or programs approved by ITD/FHWA. Contractors may also develop their own programs, but DOL or ITD/FHWA must approve them before training commences on the project. RE's may contact the Bureau of Apprenticeship and Training, USDOL, Boise, Idaho telephone (208) 334-1013, to verify DOL programs.

The following ITD/FHWA-approved programs may be utilized: (available from District EEO/ST Coordinators)

Heavy-duty Mechanic	2,080 hours
Equipment Operator	2,080 hours
Highway Construction Carpenter	2,080 hours
Truck Driver	1,040 hours
Highway Cement Finisher	1,040 hours
Highway Construction Laborer	1,040 hours

Contractors must make an effort to select training programs that address crafts that are under represented by minorities and women. There will be no Training Special Provisions requirement included in the contract if there is no under representation of minorities or women in any of the Contractor's work crafts, or in construction trades based on ITD's evaluation/analysis by geographic areas of the state.

From payroll information furnished by the Contractor, trainee/apprentice data and activity will be monitored by the Residency/Regional staff to ensure compliance with the provisions of the contract and the individual training programs.

Residency/Regional personnel will maintain information on each trainee/apprentice that contains the following:

- Name
- Social Security number
- Wage rate
- Training hours accumulated on previous jobs
- Job category (craft)
- Number of hours obtained in the approved training program
- Age

- Gender
- Ethnicity
- Hire date
- Name of Contractor
- Changes in work status
- Transfer to other project
- Termination reason

Monitoring the TSP Program

The Contractor is responsible for identifying each trainee to the RE prior to the trainee's start of work and should be so advised at the preconstruction meeting.

All trainees will keep a record of their training activities -- either USDOL "Bureau of Apprenticeship and Training Monthly Progress Report" or ITD-2776 "Trainee's Monthly Progress Record." A completed copy of the Progress Record will be provided to the RE within seven (7) days after the last working day of the month.

Project inspectors must make a daily diary entry for each trainee observed on the job. The entry shall include the trainee's name and the work they were observed doing. Example: Trainee John Doe - operating roller. Entries are made during the Inspector's normal listing of the Contractor's personnel and equipment. If the RE observes:

- That the pay rate is not increased at time increments specified in the training program, or
- That training is not being given in the craft specified, or
- That not all phases of a training program are being incorporated into the work program of each employee, or
- Any other irregularities

The RE will take action as with any specification item.

Training programs approved for use under the Training Special Provision will include documentation similar to that used by the Bureau of Apprenticeship and Training, or as approved by the EEO Office. All Contractors are encouraged to register their programs with the "Bureau of Apprenticeships and Training with the Department of Labor."

All changes to an approved trainee's status shall be reported by the Contractor to the RE, using an ITD-2775 "Training Action Request."

When a trainee completes all requirements of a training program, the Contractor must furnish the trainee/apprentice evidence that the trainee has successfully completed the training. (e.g. letter, certificate, card, etc.) Documentation of the trainee/apprentice's graduation from a program shall be provided to the RE.

Reimbursement to the Contractor under the Training Special Provision is made at the rate of \$.80 per hour of acceptable training given each trainee under an approved program.

The EEO Office will report annually, in December, to FHWA on the progress of the TSP requirements within each federal-aid contract. This information will be obtained by the CCO from the REs.

The District EEO/ST Coordinator and the CCO will audit compliance with the Training Special Provisions Program through spot checks during the project and at the completion of the project. The audit shall determine compliance with the Training Special Provisions by the Contractor and ITD

113.05 TRIBAL EMPLOYMENT RIGHTS ORDINANCES (TERO)

General

Projects located, in whole or in part, on or adjacent to Indian lands may be subject to tribal ordinances governing employment practices and fees. Such projects are identified in the contract proposal under the heading "Tribal Special Provisions."

Before commencing work on a project covered by Tribal Employment Rights Ordinances, the RE must have received a facsimile copy of the agreement between the Contractor and the Tribal Representative establishing preferential employment rights for Native Americans and the amount of the TERO fee, if applicable. The District Engineer, or designated representative must periodically (at least monthly) contact the appropriate TERO Representative for assurance that the agreement is being honored. A memo concerning the contact must be transmitted to the CCO with a copy to the Construction Engineer.

All forms identified within this Section can be found on the ITD Form Finders system. For a more detailed explanation of the use of the identified forms refer to the approved EEO Contract Compliance Plan and/or the approved DBE Plan.

EXHIBITS

113.1	Federal Aid Highway Construction Contractors Annual EEO Report	FHWA-1391
113.2A	Contractor EEO Compliance Report	ITD-0086
113.2B	Resident Engineer on Site Inspection Equal Employment Opportunity	ITD-2674
113.3A	DBE Commitments	ITD-2396
113.3B	Disadvantaged Business Enterprise Job Site Review Commercially Useful Function Determination	ITD-1701
113.4A	On the Job Training Agreement	ITD-2777
113.4B	Trainee Monthly Progress Record	ITD-2776
113.4C	Training Action Request	ITD-2775

512.00 GABION STRUCTURES**General**

Gabion structures are woven or welded wire mesh baskets filled with rocks that are normally used to structurally retain earth similar to retaining walls or to assist in sediment and erosion control. Their use requires both sound engineering design and proper construction for the application to be successful. They have been used in various forms since the beginning of recorded history.

There are five major steps of work involved in gabion structure construction:

- (a) The foundation preparation.
- (b) The assembly, or set-up, of the gabions.
- (c) Placement of the gabions into the proposed location.
- (d) Placing the rock fill in the gabions
- (e) Closing the gabions, backfilling, and finishing

On any given project all four of these operations could be occurring simultaneously. It is the responsibility of the inspector to insure that each is being performed properly. To accomplish this task the inspector must have some background in the recommended methods of handling the gabion material during each of these phases.

Construction Requirements**Preconstruction Phase**

Upon being assigned to a given project the inspector should study the plans and specifications thoroughly. If any questions arise during this study the inspector should contact the Engineer and have them addressed.

The project specifications should require the gabion manufacturer to certify that their gabions meet the project requirements in all respects, or call attention to any deviations there from. The inspector should contact the State Geotechnical Engineer or the appropriate ITD Field Service Engineer (HQ Materials) to verify that the technical information supplied by the Contractor satisfies the specifications. Refer to the QA Manual Section 270.00, page 512 for acceptance requirements. If discrepancies exist, the inspector must be satisfied they are acceptable to the designer and the Resident Engineer. This will save a great deal of time later in the execution of the project.

The inspector must obtain from the Contractor a copy of the gabion manufacturers' printed recommendations for installation of the units and be satisfied they are acceptable to the designer and Resident Engineer. Contractor designs can be constructed only after review and approval by the Resident Engineer after consultation with the appropriate HQ Materials personnel.

Gabion Assembly

The inspector should ensure the gabions delivered to the project have not been damaged during shipment. Check for damage caused by improper handling by forklifts and for excessive abrasion caused by tie-down chains. If any doubt exists as to the effects of any damage noted, the inspector should notify the Contractor to contact the gabion manufacturer for recommendations on repair or replacement.

A color stripe on the side of the folded gabion is normally used to identify the size.

The gabion fill rock, geotextile and/or granular filter media must have the appropriate inspection, testing and/or certification to be certain they satisfy the project specifications. Each of these items, and the backfill, is critical to the satisfactory performance of the gabion structure.

When the gabions are received they must be unfolded and assembled per the manufacturer's written recommendations and as approved by the Resident Engineer. Generally when first unfolded any units with a finished length over 6 feet (2m) will have an extra shipping fold. The crease caused by this fold must be removed or the unit will not be full length. One of the easiest, and most successful, methods of removing this crease is to back-stretch it over a 2x4 (50 x 100 mm) timber and walk along the sides.

The next operation is to connect the back and front panels of the gabion to the ends and diaphragms. The base wire fabric has heavier wires (2 gauges heavier) woven into it at the break lines forming the front, bottom, back and lid. The short extended length [about 4" (100mm) long] of the top selvedge wire of the ends and diaphragms should pass under, and loop twice around the heavier wire between the lid and back panels. The extended wires of the end panels should be wrapped around and to the outside so as to lock the ends and prevent them from leaning into the unit. The bottom corners of the ends may have to be re-formed slightly to permit the top wire to pass under the heavier wire.

Using approximately 5ft (1.5m) lengths of the lacing wire, cut from the coils provided with the gabions, lace the front and back panels to the diaphragms and end panels. A lacing pattern of "single loop – double loop – single loop", with the loops being spaced approximately 4in to 5in (100 mm to 125 mm) apart, will develop the same strength as the body of the space gabion mesh. The ends of the lacing wire should be looped three times around the connected seam to prevent unraveling. (Note! only wire supplied by the gabion manufacture is to be used in gabion construction! Gabion wire has a special coating which is not available in the local hardware store or supply houses). 6 in or 8 in (150 or 200mm) pliers are normally used for lacing.

Again, the connection of the gabions must be per the manufacturer's written recommendations and as approved by the Engineer. Depending on the type of structure and the physical conditions of the project the assembled units can be formed into larger modules by attaching several units together. If this form of construction is employed the inspector must make sure the corners and top and bottom edges of the units are properly aligned and laced to each other.

Mechanically Applied Fasteners

Mechanically applied fasteners (rings or clips) can be used to connect panels, diaphragms or adjacent cells in lieu of lacing wire. Only Class 3 coated galvanized clips or rings should be used with galvanized gabions. Only stainless steel rings or clips should be used with PVC coated gabions. Hog rings must have a minimum overlap of 1in (25mm) when closed.

The Resident Engineer will have to decide, after studying all of the facts, whether or not to approve this method of assembly and/or construction.

Erection of the Gabion Structure

This section applies to 3ft (1.0m), 1.5ft (0.5m), and 1ft (0.3m) thick gabions used in the construction of retaining walls, weir walls, stepped revetments, and flared zones of transition between retaining walls and sloped revetments.

When gabion units, or modules, are placed into the structure the inspector must be concerned with the alignment, grade, stretching, and attachment of the individual units to each other. The alignment and grade are established by the field engineer or surveyor but should be checked. The stretching and attachment of the gabions to each other are of primary interest to the inspector.

When several units, up to 100 ft. (33.0m), are in place and aligned, they should be stretched to tighten the wire fabric. This operation makes it much easier to control bulging during the filling operation. An anchor for the stretching operation can best be obtained by completely filling the end cell of the end unit. This may be accomplished either by machine or by hand filling. The inner tie wires (or stiffeners) shall be properly installed in both directions in this anchor cell (tie wires will be discussed later). The pulling force is then applied to the opposite end of the string. The attachment method for applying the pulling force should be such that the force is applied to at least 4 places on the heavy vertical selvedge wires forming the corners. The force should NOT be applied to the fabric of the end panel. While the stretching force is applied, the next to the last cell of the string is filled in the same manner as before. This will leave the last cell empty to provide for easier attachment of additional units. Subsequent gabions or gabion modules will be placed in the same manner with only the next to the last cell being filled during the stretching operation.

There will be times, depending upon the type of structure or the physical limitations of the project site, when it will be impossible to stretch the units. This will not affect the structural integrity of the structure. However, additional care will be needed during the filling operation to maintain alignment and prevent bulging. Typical situations in which this can occur include: (a) counter fortes behind retaining walls, (b) the main wall of weirs or drop structures, and (c) curved or serpentine walls. Gabion counter fortes and weir walls extend into narrow notches excavated into hill sides or stream banks which allow for very little working room. The shorter the radius of curvature of serpentine or curved walls, the more difficult it will be to apply a stretching force to a long string of gabions.

Seldom are the gabions stretched when used for thin splash/scour aprons or revetments. The desire in these structures is to have maximum flexibility to allow for structural adjustments which will compensate for scour and possible undercutting.

If gabions have to be placed on top of other gabions, they must be laced together on all perimeter edges. If the units are directly aligned on top of one another, this presents little problem since the workers can perform the work from the front and back of the structure. If, however, the top unit is off-set from the lower unit and extends out over the backfill, the worker will have to climb into the upper unit in order to lace the rear seam. This operation is most often overlooked by the labor crew, but it must be done.

The gabion units may be placed either as single units, modules of several units in a "string", or as modules of several units arranged in a rectangular "block". The method chosen by the Contractor will be a function of site conditions and the maximum reach of the type of equipment he plans to use to fill the units.

When the units are placed on top of a geotextile, care must be taken to insure the sharp edges of the bottoms of the diaphragms do not catch on the geotextile and pull it. This could open the overlap seam and expose the sub grade to the action of water. One method of preventing this from happening is to temporarily place thin plywood sheets on the geotextile and slide the gabion units into the correct position on the plywood. When the top edges of the units are properly aligned and "pig tailed" in position, the plywood is removed.

The geometric configuration of this type of structure may require some "cutting and fitting" to adjust for curvature of stream alignment, varying slope angles (and thus slope length) of stream banks, or angled wing walls of headwalls, etc. When a unit must be cut to fit an odd shape the cut must allow for a minimum 6in (150mm) overlap to permit proper lacing. All cutting and fitting shall be by methods approved by the manufacturer and accounted for in the design.

Filling Gabions Cells

The rock used to fill gabions must be of sound rip-rap quality, preferably graded from 4in to 8in (100mm to 200mm) in size, and roughly cubical in shape. This will allow for the maximum amount of machine filling. There will be some minus 4in (100mm) material present, due to breakage in transit, but this should be limited to a maximum of about 5%. No minus 4in (100mm) material should be permitted on any exposed face of the structure since it can fall out, be washed out, or pulled out, thus creating a void in the structure. Soil (picked up from the bottom of the rock pile) shall not be permitted to remain in the structure as a seam or "block". Some dirt or fine material is inevitable, but the amount must be minimal. Soil should be brushed or manipulated in a manner so as to provide for the required point to point contact of the large rock fill. Excessive amounts of sand/soil will wash out and create large voids in the gabion structure.

Rock should be placed in 1ft lifts in the gabion structure, moving from cell to adjacent cell. A row of 5in to 8in (125 to 200mm) size rock should be hand placed against the exposed face(s) during the filling to present a pleasing appearance and

minimize the size of exposed voids. The first fill layer is then leveled to permit the installation of the inner tie wires. When at all possible, the maximum difference of the rock level in adjacent cells should not exceed 1ft (0.3m). When 1.5ft (0.5m) deep gabions are used in a retaining wall or weir wall configuration they shall have the inner tie wires, placed only at mid-height. 1ft (300mm) deep gabions, in the same situation, do not need the inner tie wires, but should be filled in half height lifts.

Inner tie wires or stiffeners are needed to help brace exposed, or temporarily unsupported, faces of the gabions. In a long retaining wall configuration they are placed transverse to the long axis of the wall. Only the end cells, or temporary end cells, will need inner tie wires in both directions. The inner cells of walls which have thick layers, say 9ft (225mm) or 12ft (300mm) or more, do not need the inner tie wires if the adjacent cells are filled in 1ft (0.3m) lifts uniformly.

After the first 1ft (0.3m) lift of rock is laced and the inner tie wires installed, the second layer and inner ties and then the third layer are placed using the same sequence of operations. The last layer should be filled approximately 2in (50mm) above the top of the gabion to allow for subsequent settling of the rock fill. The top should be roughly leveled (no large humps or voids), and the lid closed, and then attached to the tops of the diaphragms, the ends, and the fronts.

Backfilling behind the Gabion Structure

The inspector should be very familiar with the entire project specifications involving the type of backfill material and degree of compaction required.

Backfilling any gabion structure is performed in the same manner as in any other type of construction. Most care is needed to ensure the gabion mesh wires are not damaged or broken by contact with the compaction equipment.

Caution should be exercised when backfilling a single long "string" of gabions (as in a retaining wall). To achieve the normally specified degree of compaction, the compactive effort may be sufficient to push the gabions out of alignment. If the gabions are not embedded below grade, or laced to gabions which are embedded, alignment control may become a problem. One possible solution would be to place a temporary fill in front of the gabion string to help hold alignment. Sheets of plywood can be used to keep the temporary fill from infiltrating the voids of the front face of the gabions. When compaction is completed, the temporary fill may be removed. This method may cost a little in time and effort, but it is far cheaper, and much more satisfactory, than trying to push the filled gabion string back into alignment.

The degree of compaction of backfill around gabions placed in notches in stream banks (weirs), or around gabion counterforts for retaining walls, is critical to satisfactory performance of the structure. If doubts arise the Resident Engineer and the Design Engineer should be contacted immediately.

Driving on Filled Gabions

There are times when the Contractor will request permission to drive equipment on top of gabions which have previously been filled. The answer to this question is not a simple “yes” or “no”. It depends on many factors, namely:

- (a) Type of Structure
- (b) Type of Equipment
- (c) Type of Protection to be given the gabions
- (d) Manufacturer’s Written Instructions
- (e) Requirements and Specifications and the Design Engineer

The last two factors above are the most important. The Design Engineer should be consulted before any answer is given. It is also wise to contact the gabion manufacturer for any recommendations as to the type of protection required.

Safety

During construction, and especially after completion, the entire structure must be inspected for protruding wire ends. All loose ends of the wire should, at all times, be turned back into the structure to prevent possible injury. This is especially important along the top edges of the units since workers are continually leaning over them thus exposing themselves to possible eye injury.

Documentation for Pay Quantities

The diary should be used to verify the activity date and acceptable completion of the work. Complete field notes will be required for the computation of structural excavation and compacting backfill. The dimensions of the gabions should be measured in the field and the pay item entered on the diary or the pay item report. Gabions will be measured and reported to the nearest 0.1 ft³ (0.03m³) of filled gabion complete in place.

IV - Reports

Test reports as required per QA Manual, Section 270.00

600.0 INCIDENTAL CONSTRUCTION**Access Control Issues**

During the course of a construction project, issues of access or access control may arise. Issues involving access control or encroachment on to the State right-of-way must be handled in accordance with *Administrative Policy A-12-01*, the current versions of the **Access Management Standards and Procedures for Highway Right-of-Way Encroachments Manual**.

All changes to an approach or driveway with respect to width, location or allowed use must be addressed on the ITD-606 form prior to construction or documented during project closeout by having District Right-of-Way record the changes in the appropriate documents.

Questions should be directed to the District Traffic or Right-of-Way sections or their headquarters counterparts. All changes that do not meet the requirements of *Administrative Policy A-12-01* must have the Chief Engineer's approval. Additionally, FHWA must give approval for any changes involving the Interstate access. Normally the Construction Section will make this coordination.

All issues involving access control or encroachment on to a local right-of-way must be handled in accordance with the local entity's (county, city or highway district) policy and should be directed to the local entity for resolution.

If increases or decreases in costs are involved in the changes, a change order must be prepared. All changes must be noted on the "**as constructed**" plans and in the appropriate right-of-way documents.

Additions and Deletions to Landowner Facilities

The addition or deletion of pipes, fences, ditches, minor structures, or similar features shall be covered by a supplemental right-of-way agreement and if necessary a change order. If a fence, gate, or similar item is not installed, the material can not be given to the landowner.

Some manufacturing organizations may not have established metric standards for their products, i.e. pipe lengths, guardrail lengths, etc. Consequently the metric equivalents in this section are approximate only.

Conversely, some products, i.e. corrugated metal pipe diameters, reinforcing steel, concrete designations (classes), etc., have been standardized for metric sizes and designations. These are fixed and also do not necessarily reflect direct mathematical conversions. The nearest equivalent size or designation is shown.

601.00 CONDUITS**Pipe Lists and Ordering**

Since most contracts now involve contractor surveying the Engineer should verify that the Contractor is preparing pipe lists in accordance with Subsection 106.02. In the rare event that the surveying is performed by the State the Engineer should prepare and furnish to the Contractor the corrected list of sizes and lengths of pipe at the earliest opportunity, thus avoiding a late delivery and delaying the progress of the work.

Ensure care is exercised in preparation of the pipe list. The list should be prepared from the field stake notes for installation and not from information taken from the plans which are only an estimate. Installations, such as siphons, that require special fabrication at the plant for elbows and bends must have an accompanying line sketch showing the exact dimensions and angles needed. Copies of the pipe list should be retained by the Engineer.

The adjacent landowner should be contacted, if possible, to assure that the irrigation and drainage facilities planned will fit the landowner's operation after the construction of the project. The direction or method of irrigation may have changed since the design was completed. The right of way agreements must be checked to ensure that requirements coincide with the plans. Supplemental agreements may be necessary to effect changes that are advantageous to the owner and the Department.

Staking

At the time the pipe list is made up pipes should be completely field staked. Staking may not always be done at this time; but if the Contractor's operations can accomplish the staking, it is advisable to do so. Many different methods are used to stake pipe. Generally, an offset line is used showing the alignment of the pipe and a grade reference from this line to the flow elevation of the pipe. Short pipe may only require end offset points for alignment with a grade reference.

Another method for staking pipe involves a set of field notes showing what was staked with space provided on the same notes for the installation inspector to record the re-measure dimensions for excavation and backfill. This consolidation of field data simplifies the computation of quantities for final payment. On projects where an exceptionally large amount of pipe is to be used, the Contractor or the Engineer may create a field form that would include all original field data and subsequent inspection data.

Inspection

Pipe should be inspected in the field, and rejection due to damage or manufacturer's defect is the responsibility of the field inspector. Remember that as pipe is delivered to the project, it will be handled many times and may become damaged. Thoroughly inspect each length of pipe, making sure that it is the type called for on the plans and that no defects exist. Special attention should be given to bituminous-coated pipe for uniformity in coating and scuffmarks. Concrete pipe should be checked for roundness and cracking from transit. Rubber gaskets used with concrete pipe must be examined to ensure that the gaskets are of the proper size and quality.

Pipe will be certified as outlined in the Quality Assurance Manual. Do not overlook the inspection of the gasket and gasket lubricant for conformance to specifications.

Checked all pipeline installations for alignment and grade. Each joint shall be checked for proper fit, the presence of a gasket, proper alignment and that it forms a good seal.

All trenches are susceptible to dangerous cave-ins. Be aware of OSHA requirements and avoid unsafe practices. Various methods of shoring can be employed. On deep trenches, a movable metal box may be pulled along through the trench with the complete operation of placement being carried out; i.e., fine grading, pipe placement, backfilling, and tamping. If a deep trench has sheeting, the sheeting should be withdrawn gradually as the backfill is placed and contact with the trench walls is gradually established.

Backfill should be placed on both sides of the pipe in even lifts so as to avoid pushing the pipe out of alignment. Large size granular backfill should be placed so that the fill does not drop directly on the pipe and cause impact damage. Special protection should also be given to trenches in urban sections that are left open for any period of time. Proper signing, delineation, and barricades must be erected to make the public aware of the potential danger.

Every cable, pipe, tube, or any significant object that the trench intercepts shall be recorded with the following information: description (kind, size, etc.), stationing, depth (from a reference datum), and what the Contractor did about the object. If the service of a disturbed line is stopped due to trench excavation, the Contractor should immediately undertake the necessary action to restore service. Applicable information should be added to the as constructed plans.

Some projects call for the same size of metal pipes at different locations with different thickness (gages). Generally heavier thickness is because of higher fills, but the needs for a heavier thickness might also be due to soil pH or the pH of the water being transported. Be sure to get the right pipe in the right location and check with the District Design section before changing a pipe thickness.

Documentation for Pay Quantity

On projects containing a large number of conduits the ITD office staff should maintain a check sheet for all conduits on the project. The location and size can be entered with a subsequent entry showing the final quantities. The procedure simplifies the total inventory of conduit and will preclude any duplication of payment.

All conduit stake notes and computations should be kept in a logical sequence for ready reference and verification. A little time spent setting up good conduit records greatly contributes to the accuracy and ease of work later.

Complete field notes and survey records of the original ground and final re-measure are essential for computing the actual quantities of structure excavation and compacting backfill. Good coordination must exist between the survey crew and the installation inspector.

Estimated quantities may be used for backfill and excavation prior to the final measurement and computation for quantities. These entries, in both the diary and ledgers, should be shown as estimated quantities.

The diary will also be used to verify the activity, date, and location of the work.

Reports

Report compaction of backfill on the ITD-850, Nuclear Density and Compaction Report for Soil and Aggregate.

602.00 CULVERTS**General**

The specifications for installation of pipe are intended to provide a lasting and well-designed conduit. The designer cannot foresee special problems that may result after a trench is excavated. Foundations should be carefully examined and unsuitable foundation material removed. Unsuitable materials include but are not limited to: construction debris, organics or other soft soils, oversized rocks and frozen material. Removal is shown on the standard drawing.

During the backfilling operation, the inspector must verify the required density of the backfill by compaction tests as required by the minimum testing requirements. Tests may only be omitted when some other special means of compacting backfill is approved and used. Adequate hand tamping of the backfill material under the sides of the pipe is very important. Pipe may be damaged, after the project has been completed, by settlement of the backfill.

Uniformity of the bedding grade is usually checked with a reference string line pulled parallel to the bed prior to pipe placement. Careful inspection of the bed shall insure that no large rocks are embedded in the graded surface. Rocks just below or at the surface of the bed may act as point bearing and damage the pipe causing subsequent leaking or failure.

As soon as the inspector has approved the pipe bedding, the structure excavation and compacting backfill measurements should be taken. Re-measurement should be completed prior to placement of the foundation material.

The additional weight of hoisting equipment next to an open trench may create a safety hazard and shoring may be required. Whenever an unsafe condition is discovered advise the Contractor and stop all applicable work until the situation is remedied. Sandy, supersaturated soils are particularly susceptible to sudden cave-ins.

Placing Corrugated Metal Pipe

The inspector shall make certain that the rivets or bolts on the joint band angle iron are not pulled through the band due to excessive tightening. Each band must be tight and the pipe ends butted together for a corrugated metal pipe to function properly. Be sure, in the case of metal culverts, that a pipe of the proper thickness (gage) is being installed. A common practice is to install pipe prior to earthwork operations and then allow vehicles to travel over the pipe. A pipe placed in this manner is susceptible to crushing due to heavy loads. The inspector should check all pipes to ensure that they are in their original undamaged condition at the completion of earthwork operations.

Bituminous coated corrugated metal pipe often will be scuffed during handling. After the coated pipe has been placed, the scuffed areas shall be coated with hot penetration grade asphalt. Additional applications may be necessary to achieve the required thickness of coating. The bituminous coating on pipe bands must also be inspected to ensure full coverage. Currently there is no thickness specification.

Placing Concrete Pipe

The pipe bed, after fine grading, shall have depressions dug out for the pipe bells. The pipe shall lie on the bedding along its length with the exception of the depressions for the bells. Under no circumstances shall the pipe be supported at the bell. The inspector must make sure that the bell is clear of the ground after the connection is made to the next length of pipe.

Reinforced concrete pipes of larger dimensions are stress-oriented using elliptical or double line circumferential steel for reinforcement. According to the placement of this steel, the pipe is marked for the top and bottom alignment. These marks shall lie in a vertical plane.

Occasionally, while placing reinforced concrete pipe of 24 inches (600 mm) diameter or less, a bell will be somewhat tight for the spigot. The Contractor, in forcing the joint together, may cause hairline cracks in the bell that are parallel to the length of the pipe. The Contractor should advise the materials supplier of the condition, and the pipe may be subject to rejection. This condition may be detrimental to pipes that are under pressure, such as siphons or irrigation lines.

Rubber gaskets require care in fitting. The gasket must be fitted properly in order to obtain tight joints. To insure good fitting joints, keep gaskets and joints clean. A very small amount of soil will greatly inhibit proper installation. Lubricants, such as flax soap, bentonite vegetable soaps, etc., as recommended or supplied by the pipe manufacture are used on the joints. Petroleum products are NOT permissible for joint lubricants.

Documentation for Pay Quantity

On projects containing a large number of pipes, the Engineer should maintain a check sheet for all pipes on the project. The location and size can be entered with a subsequent entry showing the final quantities. The procedure simplifies the total inventory of pipe and will preclude any duplication of payment.

All pipe stake notes and computations should be kept in a logical sequence for ready reference and verification. A little time spent setting up good pipe records greatly contributes to the accuracy and ease of work later.

The length of the culvert shall be confirmed by measurements and noted in the diary or on pipe notes. Payment shall not be made for lengths greater than approved by the Engineer. Quantities shall be measured and reported to the nearest foot (0.3 m). Compacting backfill and structure excavation is paid on the basis of quantities calculated from cross-sections and in accordance with Section 210.

When the culvert ends in a headwall or minor structure, the back of the headwall will be the outer limit for payment of structure excavation and compacting backfill. Excavation for pipe outside of the roadway prism will be paid for as structure excavation the same as within the roadway prism unless otherwise specified.

Complete field notes and survey records of the original ground and final re-measure are essential for computing the actual quantities of structure excavation and compacting backfill. Good coordination must exist between the field survey crew and the installation inspector.

Estimated quantities may be used for backfill and excavation prior to the final measurement and computation for quantities. These entries, in both the diary and ledgers, should be shown as estimated quantities.

The diary shall also be used to verify the activity, date, and location of the work and may also be used for reporting the quantities and final measurements.

Reports

Report compaction of backfill on the ITD-850, Nuclear Density and Compaction Report for Soil and Aggregate.

603.00 PIPE SIPHONS**Placing Pipe Siphons**

The information in Section 602, Culverts, applies to siphons as well. Siphons usually are trenched into steep back slopes. After initial hand tamping along the pipe and bed contact zone, compacting backfill may be performed on horizontal lifts if the slope is too great for parallel-to-bed lifts. Exhibit 603.00-1 depicts this method.

The importance of sealing the inlet and outlet cannot be overemphasized. Water escaping at these locations invariably follows the outside of the pipe down into the roadway. This condition not only causes washing around the pipe, but also may lead to excessive moisture in the roadbed at that location. The condition may compound itself by frost heaves or softening of the travel way and cause failure. Compaction at these locations is especially critical. The entire length of the siphon right and left of the roadway prism shall be backfilled with specified material. Siphon headwall wings and aprons require special care; the length of the wings and depth of the apron should be extended, if needed, to prevent washing out. Dense soil should be compacted around the headwall providing additional sealing against water penetration. Be sure, in the case of metal siphons, that the proper thickness (gage) of pipe is installed.

Testing Siphons

The entire length of the siphon should be left exposed until the siphon has been tested. After filling the siphon with water, the inspector must examine the pipe for leaks. Some seepage through the pipe walls will occur on concrete pipe but many times will cease after soaking awhile. Pouring a reinforced concrete collar may repair joint leakage. Exhibit 603.00-1 depicts an acceptable repair collar.

Documentation for Pay Quantity

Documentation for Siphons is similar to Culverts. See 602.00.

Reports

Report compaction of backfill on the ITD-850, Nuclear Density and Compaction Report for Soil and Aggregate.

604.00 IRRIGATION PIPE LINES**Placing Conditions**

Placement of irrigation pipe shall conform to the placement requirements for culverts. (See Section 602.00.) Compaction of the backfill material placed within the roadway prism (i.e., between cut or fill catch points) shall be as specified for culverts. Backfill outside the roadway must be compacted by "puddling", tamping, or rolling in a competent manner even though no percent of compaction is specified. (Puddling is the orienting of soil particles into a dense position by the use of water. Use of this method is particularly advantageous around minor structures since the "puddling" action will occur when the facility is placed in operation. Be sure, in the case of metal pipelines, that the proper thickness (gage) is installed. See Section 601.00.)

Testing Line

Corrugated metal pipe irrigation lines generally have greater leakage than concrete pipelines, so before the pipeline is accepted, the pipe shall be tested for leaks. Leaks shall be located and repaired in a satisfactory manner before approval. The inspector must personally supervise the test and maintain a close check on the progress of the test.

Concrete pipe will absorb water and many small cracks will close up. Special care should be exercised in the protection and care of irrigation pipelines during construction. Concrete lines are especially susceptible to crushing or breakage due to the lack of metal reinforcement in them. The Contractor must be advised to keep heavy equipment away from irrigation pipelines after installation. Risers or outlets should be clearly marked to avoid damage.

Documentation for Pay Quantities

Documentation for irrigation pipe lines is similar to Culverts. See 602.00.

Reports

Report compaction of backfill on the ITD-850, Nuclear Density and Compaction Report for Soil and Aggregate.

605.00 SEWERS

Placement of a sewer line, manholes, catch basins, and inlets shall conform to the placement of culverts and siphons. Excavation and backfill shall be as discussed in Section 602, Culverts. During the placement of a sewer line, severe ground water conditions are often encountered. Many times, little or no space is available to perform dewatering operations. Whenever possible, the pipe should be installed when the ground water level is at its lowest elevation. Sewer line placement under adverse conditions requires extra care to insure proper gasket installation.

Manhole connections may be made by laying the pipe continuously through the manhole location. The manhole base is then placed. After the base is cured, the pipe is broken out to provide access to the line. All broken masonry must be removed and irregular edges grouted. It is also permissible to form an invert in the manhole base rather than laying pipe through the manhole if desired.

During placement operations, the inspector must spot-check the grade with a level. Good practice is to spot-check the grade points every 20-30 ft (6-9 m) or once on pipes of 3-6 ft (1-2 m) lengths. The inspector must check all of the grade stakes, verify the entire grade and check the beginning and ending elevations at manholes, catch basins, etc.

Placement of sewer lines in urban areas requires the utmost control for grade. Storm sewer lines are designed to take care of all surface drainage in the project. A change in grade on curb and gutter will almost invariably cause a similar change in grade on a catch basin or flow line of the sewer. Complete checking of all surface grades and line grades cannot be overemphasized.

When the project will not be completed in one season and the catch basins have been installed, but the pavement is not complete, provisions must be made for getting the drainage into the basins. Holes may be left in the wall at the necessary elevation. The holes should not be too low, as this will cause washing and plugging. The holes should be of 4-6 in. (100-150 mm) in size to avoid plugging.

Testing Sanitary Sewer Line

The sequence of operations in testing a sewer line is as follows: using pipe plugs, a section between two manholes (including the manholes) is blocked off so that water may flow in the pipe between the two manholes but not enter the line before the first manhole or after the second manhole. Exhibit 605.00-1 shows a sewer line test. The inspector must be present during filling of the test section to check that water can flow from one manhole to the next manhole. The head measurement is made in the upstream manhole. The measurements of the water depth in the manhole allow water volume loss to be determined from manhole dimensions. Both manholes' water levels will drop and the two volumes of water must be added together.

An alternate method for testing sanitary sewer lines has been added to the specification. This low-pressure air method must have special attention to assure that a good, firm plugging system is used. A 12 inch (300 mm) diameter plug will produce 450 pounds (2002 Newtons) of force and increases by the square of the radius of pipe being used. Safety precautions must be taken due to the high safety risks that are involved with this method.

Documentation for Pay Quantities

Documentation for Sewer Lines is similar to Culverts. See 602.00.

Manholes, catch basins, and inlets shall be computed and reported to the nearest whole unit. Sewer pipe shall be measured and reported to the nearest foot (0.3 m).

Reports

Report compaction of backfill on the ITD-850, Nuclear Density and Compaction Report for Soil and Aggregate.

606.00 PIPE UNDERDRAINS

General installation conditions are the same as for culverts. Perforated pipe is used for under drains and normally is placed with the perforations down. The placement helps prevent infiltration of silt, gravel, or other solids that might clog the line and destroy the effectiveness of the system. Placing the perforations down also lowers the water table.

Special backfill should be used to provide a free draining material to carry the water from the aquifer to the pipe. Care must be taken to assure that this flow is not interrupted by the introduction of a stratum of impervious material, such as topsoil. Materials used for special backfill should be sound and not degrade under water conditions or compactive effort. Backfill material should be graded to meet adjacent soil size and pipe perforations. Use of filter fabric is encouraged to prevent soil migration and pipe clogging. In the case of metal pipe, be sure the proper thickness (gage) is installed.

Documentation for Pay Quantity

Documentation for Pipe Underdrains is similar to Culverts. See 602.00.

Reports

Compaction of backfill and special backfill when required, shall be reported on ITD-850, Nuclear Density and Compaction Report for Soil and Aggregate.

607.00 EMBANKMENT PROTECTORS

A special problem is usually encountered when compacting the material around spill pipes and embankment protectors. These installations are highly susceptible to washouts at the inlets. Pipe washouts are usually due to inadequate sealing around the inlet structures. A dense, fine material should be used for the bedding and backfill of the area around the inlet. The soil should be free of organic material and provide a seal against water penetration to reduce the possibility of a washout. The entire bedding and backfill material of a spill pipe or embankment protector should be a dense material whenever possible. A common error in constructing the area around the inlet is not providing adequate slope for the drainage to enter the pipe. In many cases, especially on relatively steep grades, the drainage runs past the inlet area. In the case of metal pipes, be sure the proper thickness (gage) of pipe is installed. See Section 601.00.

Documentation for Pay Quantity

The diary shall be used to verify the activity, date, and location of the work and reporting the quantities and final measurements. If the project has a large number of these items, a summary sheet may be helpful. Embankment protectors shall be computed and reported to the nearest whole unit. Discharge pipe shall be measured and reported to the nearest foot (0.3 m).

Reports

None.

608.00 APRONS FOR PIPES**Inspection**

Aprons should be inspected in the field, and rejection due to damage or manufacturer's defect is the responsibility of the field inspector. The inspector must keep in mind that as material is delivered to the project; it will be handled many times and may become damaged. Thoroughly inspect each apron, making sure that it is the type called for on the plans and that no defects exist. Concrete aprons should be checked for roundness and cracking from transit. Rubber gaskets used with concrete must be examined to ensure that the gaskets are of the proper size and quality.

Do not overlook the inspection of the caulking, gasket and gasket lubricant, if applicable, for conformance to specifications.

Care must be taken during installation that the placement of the apron lines correctly with the direction of the flow to ensure that the flow will not bypass the apron or undermine it. This is especially critical on skewed installations. Rip rap should be applied if necessary to prevent erosion around and under the inlets/outlets.

It is also critical that the mounting base material be at the proper elevation and compacted properly as must the backfill material.

Documentation for Pay Quantity

On projects containing a large number of aprons, the Engineer should maintain a check sheet for all aprons on the project. The location and size can be entered with a subsequent entry showing the final quantities. The procedure simplifies the total inventory of aprons and will preclude any duplication of payment.

When the culvert ends in an apron, headwall or minor structure, the back of the headwall will be the outer limit for payment of structure excavation and compacting backfill on the culvert. Structure excavation and compacting backfill work related to the apron installation is considered incidental.

Aprons will be paid for by the "each" unless otherwise indicated.

The diary shall also be used to verify the activity, date, and location of the work and report final pay quantities.

Reports

None.

609.00 MINOR STRUCTURES

The same quality of workmanship is required for minor structures as any other structure. The cost of minor structures is extremely high as compared to other work on structures.

The adjacent landowner should be contacted, if possible, to assure that the minor structures planned will fit the need and operation of the landowner after the construction of the project. Many times, the direction or method of irrigation has changed since the design was made.

Right of way agreements must be checked to assure their requirements coincide with the plans. Supplemental agreements may be necessary to effect changes that can be advantageous to the owner and the Department.

Staking

Normally, this work is performed by the contract surveyor. In the rare case that State personnel perform this work the following guidance is offered. Minor structures will be constructed in conjunction with drainage facilities. Plans on minor structures should be checked for discrepancies. Omissions with respect to the number of ditches connecting a structure and errors in direction of flow are frequent. The elevation of the flow line of the ditch with respect to the flow line of the pipe often varies from that presented in design. Elevations of the tops of minor structures require careful attention and a vertical extension of the structure walls may be required. The top of an irrigation structure should be at least 4 inches (100 mm) higher than the ditch banks. Correct elevations are essential so that minor structures serve the purpose intended.

When the original staking is done for minor structures, the surveyor should be familiar with the entire drainage pattern. A minor structure should not be staked as an isolated part of the system. Verify all elevations match so that a continuous uniform flow from one right of way to another is obtained. Many times, situations change between the time the designer first conceived what should be constructed and the time of actual construction. The surveyor may be the only ones able to discover needed changes.

Inspection

Concrete construction requirements apply to minor structures and must be followed. The inspector should check all forms prior to placing concrete for correct dimensions and steel reinforcement. The location of keyways, bolts, and other special items that must be in place before pouring the structure must be checked. A check should be made from a distance to see that the portions of the structure are in the correct place and proper position. Do not assume that the survey crew has correctly interpreted the design. Do the wingwalls fit the ditches? Can the landowner regulate the flow if more than one ditch begins at the structure? The appearance of these minor structures from the roadway must also be considered.

Documentation for Pay Quantity

The quantities representing the minor structure should be verified by quantity computations. If the original computation matches the plan quantity within 0.1 cubic yard (0.1 cubic meter) for concrete and 5 pounds (2.5 kilograms) for metal reinforcement, no additional check is required. On projects where there are a large number of minor structures, a complete structure listing by location and station is advisable, as it may become difficult to determine which structures have been built and paid for. The list should be kept in conjunction with a pipe summary.

Verification of the quantities by computations is the only documentation necessary for ledger entries. Estimated quantities may be used prior to final computations; however, there should be few occasions when this is necessary. Concrete shall be computed to the nearest 0.01 cubic yard (0.01 cubic meter) and paid to the nearest 0.1 cubic yard (0.1 cubic meter). Metal reinforcement, to the nearest pound (0.5 kilogram) and timber to the nearest 0.01 MFBM (0.25 cubic meter).

Reports

Report compaction of backfill on the ITD-850, Nuclear Density and Compaction Report for Soil and Aggregate.

610.00 FENCES

Temporary fences may be required to restrict livestock or protect the work. All temporary fences are the responsibility of the Contractor unless otherwise called out in the contract. The 107.08, 107.11, and 107.19 subsections should be cited for enforcement.

Any changes in the location or number of approaches, driveways, or gates must conform to the requirements of the access control established for the project and will require the Chief Engineer's approval if either the location, width, allowed use or number of approaches or driveways does not meet with the requirements of *Administrative Policy A-12-01*.

The addition or deletion of pipe, fences, ditches, minor structures, or the like shall be covered by a supplemental right of way agreement. Approaches shall be constructed in accordance with the plans and **Access Management Standards and Procedures for Highway Right-of-Way Encroachments Manual**.

Staking

Particular attention should be given to the staking and establishment of the fence lines. An offset line within the right of way may be desirable. A good offset line, 5 to 10 feet (1.5 to 3 m) from the right of way line becomes an excellent reference for other features on the project. Extreme care must be exercised in staking fence around interchanges to insure the right of way lines close accurately in these areas. Sometimes the fence stakes may need to be denoted with a color-coded lath to aid the Contractor in keeping other staked features on the project separate from the fence. Reference *Administrative Policy A-05-19* for location of the fence with respect to the R/W line.

Inspection

The inspector should first determine that all materials on the project meet specifications. Fence is accepted on a pass/fail basis. Should the Contractor desire to install fencing material before test results are available for acceptance of the materials, the inspector should inform Contractor that replacement of unacceptable material will be the Contractor's responsibility. The inspector must be able to identify and locate all different lots of materials so any unacceptable materials can be removed.

Obstructions and vegetation must be cleared from the fence line prior to construction and in conformance to the specifications. The inspector must be satisfied that the fence is properly staked. Judgment on the part of the inspector must be exercised in determining the correct wire tension. Area climate and temperature at the time of installation will determine the amount of tension.

The inspector should also be aware of the location of utilities, headwalls and pipe structures that may interfere with the proper alignment of the fence. An on-the-spot review prior to installation will avoid unnecessary conflicts.

The Contractor should be cautioned that equipment and work must be confined to within the right of way or construction easement. A fence Contractor that trespasses outside of the right of way or construction easement, without the property owner's consent may strains public relations and could result in legal action.

Documentation for Pay Quantities

Final fence quantities are to be entered in the ledger only after final measurement has been made. Daily estimates may be used for progress estimate payments. The diary shall be used to verify the activity, date, location, and final and estimated quantities for payment. A summary sheet may be used for the braces and gates. Braces and gates shall be computed and reported by the unit. Fence shall be measured and reported to the nearest foot (0.3 m).

Reports

None.

611.00 CATTLE GUARDS**Inspection**

Thoroughly inspect all materials making sure that it is the type called for on the plans and that no defects exist.

Care must be taken during installation that the placement of the guard matches the existing roadway slope or crown and that the appropriate pit slope exists for drainage.

It is also critical that the bearing pad materials be at the proper elevation and bonded properly or secured as specified.

All exposed metal surfaces must be painted as called for and all hardware fasteners must be galvanized.

Documentation for Pay Quantity

Structure excavation and compacting backfill work related to the cattle guard installation is considered incidental unless otherwise indicated.

Cattle guards will be paid for by the "each" unless otherwise indicated.

The diary shall also be used to verify the activity, date, and location of the work and report final pay quantities.

Reports

None.

612.00 GUARDRAIL

Since the designer does not have the opportunity to view the completed roadway for detailed guardrail design, the Engineer should inspect the roadway for guardrail requirements and revisions as soon as cut and fill sections are completed in the grading operation. In many sections, the rail may have to be extended to reduce a hazard. Immediately after this roadway inspection, the Engineer should develop a corrected guardrail order list so that the Contractor may obtain the correct number of posts and lengths of guardrail. At the preconstruction conference, the Contractor should be advised of the possibility of guardrail changes.

The appearance of guardrail is critical under the aspects of highway beautification. Elevation of the tops of posts shall be uniform giving a smooth transition into curves and slopes. The posts must be well tamped to assure vertical alignment as well as safety. Care shall be taken so as not to violate design standards when changes are made in the field. Generally, lengthening a run will not violate a standard. Shortening of a run of guardrail beyond that needed for embedment, interchanging of terminal types, modifying post lengths, or connections, etc. may violate a design standard and should be checked by District Design before implementing. A design exception may be necessary.

Note during installation that end terminals (both interim and permanent) which are left exposed to traffic where the speed limit is higher than 35 MPH and that could spear, vault or roll a vehicle are not in compliance with NCHRP-350 and need to be protected or replaced as applicable..

Documentation for Pay Quantity

The diary shall be used to verify the activity, date, and location of the work and report final pay quantities. Terminal sections shall be computed and reported to the nearest whole unit. Guardrail shall be measured and reported to the nearest foot (0.30 m). The pay quantity for guardrail should conform to the ordered amounts and all ordered amounts must have proper certifications for the quantities involved.

Reports

None.

613.00 SIDEWALKS

Sidewalk appearance is important with respect to highway beautification. Uniform color and edge alignments are two important appearance factors. Long-term appearance depends upon prevention of: cracks, surface spalling, and differential settlement.

Subgrade compaction shall be carried out according to specifications. Occasionally water conditions or soft soil conditions may require a course of aggregate base to be placed under the sidewalk.

Sloping sidewalks may require a nonskid surface, such as transverse brooming, in order to reduce slipping hazards.

Documentation for Pay Quantities

The diary shall be used to verify the activity, date, and location of the work and report estimated and final quantities. Calculation sheets or field notes may also be used to report final quantities. Quantities will be calculated to the nearest 0.1 square yard (0.1 square meters) and rounded to the nearest square yard (square meter) on the estimates.

Reports

Report compaction tests on the ITD-850, Nuclear Density and Compaction Report for Soil and Aggregate.

614.00 URBAN APPROACHES

Driveways and approaches are normally constructed to stop at the right of way line with the intent to provide a serviceable access and protect the road edge. Radii as well as grade should be staked. Care should be taken so that the width and stationing is staked according to plan with a smooth elevation transition to the existing driveway or access road surface.

All changes to an approach or driveway either in width, location or allowed use must be addressed on the ITD-606 form prior to construction or documented during project closeout by having District Right-of-Way record the changes in the appropriate documents and must be handled in accordance with *Administrative Policy A-12-01*, the current version of the **Access Management Standards and Procedures for Highway Right-of-Way Encroachments** manual.

Questions should be directed to the District Traffic or Right-of-Way sections or their headquarters counterparts. All changes that do not meet the requirements of *Administrative Policy A-12-01* must have the Chief Engineer's approval. Additionally, FHWA must give approval for any changes involving Interstate access. Normally the Construction Associate for that District will make this coordination.

If an approach or driveway is moved and if costs change, a change order will be prepared. **All changes must be noted on the "as constructed" plans.**

Documentation for Pay Quantities

The diary shall be used to verify the activity, date, and location of the work and report estimated quantities of materials used. See:

- Surface Courses & Pavement - Section 400.
- Concrete - Section 502.

Urban approaches shall be computed and reported to the nearest whole unit.

Reports

Report compaction tests on the ITD-850, Nuclear Density and Compaction Report for Soil and Aggregate.

615.00 CURB AND GUTTER

Along with sidewalks, the curb and gutter comprise the finishing touches of a road or street. The alignments, finish, matching with old curb, grade, etc., are important factors in the appearance of the final result.

Staking

The spacing of grade and alignment stakes will vary from 10 to 25 feet (3 to 7 meters) depending upon field and design conditions, such as vertical curves and radii. Since 10 ft (3 m) long form sections are often used, a staking interval of 10 feet (3 m) is good practice. Grade stakes for the aggregate base course should not be placed so that the rolled plantmix is ever below the lip of the gutter. This will prevent the roller from overloading the lip of the gutter.

Inspection

Curb curing shall be performed according to the specifications. If curing compound is used, it must be sprayed on immediately after the finishing is completed as specified.

In construction of extruded curbs, there may be a tendency of the machine to climb when placing around a sharp radius and matching to an existing curb. The machine operator must adjust to this situation.

Documentation for Pay Quantities

Diary entries must be made for estimated and final quantities. If a pay item is an estimated amount, clearly mark this is an estimated item. The diary shall also be used to verify the activity, date, and location of the work. Curb and gutter will be measured and reported to the nearest foot (0.3 m).

Reports

None.

616.00 SIGNS and SIGN SUPPORTS

As soon as grading operations permit accurate determination of sign placement and signpost lengths, a list of sign post lengths will be developed by the Contractor for approval by the Engineer in accordance with Subsection 106.02 of the specifications. The list must be developed at an early date, especially where steel signposts are involved, as fabrication may require a considerable amount of time. If the placement of a sign or signs at the location shown on the plans is impractical, the District Traffic Engineer should be contacted to determine a new location.

Foundations

Concrete sign foundations for breakaway steel posts must be set at proper elevations with respect to the finished ground line. A foundation that is located too high becomes a roadside hazard rather than an integral part of a safety feature. A foundation that is too low can also create a roadside obstacle due to impairment of the intended breakaway action by soil or aggregate in the breakaway plane.

Breakaway Post Fabrication and Erection

Inspection of breakaway H beam posts should verify that fuse plates have been installed after galvanizing. If the signposts are delivered preassembled, torque of the fuse plate bolts should be checked on sufficient posts to verify the proper fuse plate bolt tension.

For three and four bolt slip bases proper breakaway of type "A" and "B" signposts is contingent on having the correct torque on the slip base bolts. Over tensioning of these bolts may reduce the effectiveness of the breakaway design and can even cause failure of the anchor bolts on vehicular impact. The slip base bolt torque must be carefully checked.

Break-Safe systems do not require a specific torque. Follow the manufactures recommendations for the hinge plate (fuse plates) couplers and bolts for tightening requirements. Break-Safe slip bases are addressed in Standard Drawings I-8-A (1&2), I-8-B (1&2), I-8-C (1&2) and I-8-D (2&3).

Anchor Bolt Repair

Units with three and four bolt slip bases it is important that high-strength anchor bolts be protected prior to erection of the signposts to avoid having them bent or broken by construction traffic. Repair of broken or bent anchor bolts is quite expensive and welding is not an acceptable method of repair. Broken or badly bent high-strength anchor bolts shall be repaired by total foundation replacement or by using high-strength sleeve nuts.

This second method of repair requires that a portion of the foundation be removed to a point that will permit the installation of the sleeve nut to be entirely embedded in the replaced concrete. The sleeve nut and bolt extension must be adequate in size to develop the strength equivalent to the original design. The sleeve nut and bolt extension must be cadmium plated.

Straightening of badly bent high-strength anchor bolts should not be allowed, as these bolts are extremely brittle. Although they may appear okay after straightening, they are fractured and may later fail under very light loading conditions. For information on high-strength bolts, refer to Exhibits 504.00-1 and 2.

Working Drawings (Shop Drawings)

Working drawings for sign structures and signal supports are to be submitted by the Contractor for approval as indicated in Subsection 105.02 and as modified by Subsection 616.03. Final submittals of shop drawings for these structures shall be transmitted to the Traffic Engineer for storage. The submittal shall be on 22 in. x 34 in. (559 mm x 914 mm) mylars.

The submittal shall also include CADD drawings in the acceptable format.

Documentation for Pay Quantity

The diary shall be used to verify the activity, date, and location of the work and report final pay quantities.

Reports

None.

617.00 DELINEATORS AND MILEPOSTS

Delineators and mileposts shall be installed at the stations and offsets indicated in the plans.

The Traffic Manual and Standard Drawings should be consulted to verify proper type, use and installation.

Documentation for Pay Quantity

The diary shall be used to verify the activity, date, and location of the work. Quantities will also be documented by diary entry.

Reports

None.

618.00 MARKER POSTS, WITNESS POSTS, AND STREET MONUMENTS

The Traffic Manual and Standard Drawings cover the subject of marker posts, witness posts and street monuments.

Marker posts, witness posts and street monuments shall be installed at the stations and offsets indicated in the plans.

Documentation for Pay Quantity

The diary shall be used to verify the activity, date, and location of the work. Quantities will also be documented by diary entry.

Reports

None.

619.00 ILLUMINATION

This work, as well as other electrical work and signalization, is very specialized requiring the services of a licensed electrical contractor. Few inspectors have had sufficient experience to thoroughly and adequately inspect this type of work. To overcome this problem, it is recommended that the District Signal Electrician work closely with project personnel to assure plan and specification compliance.

Experience has proven that many potential problems can be averted or minimized by a pre-operational meeting involving the electrical contractor or subcontractor, project personnel, and the Signal Shop Superintendent or District Signal Electrician. This special pre-operational meeting should be held immediately prior to starting the electrical work. It is especially important that the Contractor's job Superintendent or Foreman attend this meeting. The conduct of the meeting should be informal and cover the real "nuts and bolts" problems that may be expected or that have occurred on previous projects.

Common Construction Errors

Over the years, a number of recurring construction errors have been discovered regarding electrical work either at final inspections or later when maintenance work was being performed. A list of these more common errors follows. This list is included as a reminder for inspection personnel and should not substitute for the above recommended pre-operational meeting where this list should be presented and discussed with the Contractor.

A. Conduit Installations

1. Use of plastic conduit for elbows greater than 45° instead of steel, as required, causing conduit to be cut when wire is pulled.
2. Steel elbows require bonding when used with Rigid Plastic Conduit.
3. Minor bends in conduit without proper use of bending tool causing partial collapse of conduit and resultant problems pulling wire through conduit.
4. Use of rocky material for conduit backfill instead of fine soil or sand which results in eventual collapse of conduit.
5. Failure to clean dirt and moisture from conduit prior to pulling wire.

6. Failure to cap stub ends and free ends of conduit resulting in intrusion of soil and moisture.
7. Conduit buried at less than required 24 in. (0.6 m) depth causing future maintenance problems, such as inadvertent cutting or mashing of conduit.
8. Placement of conduit by other than a qualified, licensed, electrical Contractor. This can result in rejection by the State Electrical Board.
9. Placement of conduit at locations other than shown on the plans without proper indication on the as-constructed plans.

B. Foundations

1. Improper or wrong size anchor bolts installed or installed out of alignment for proper pole base plate fit.
2. Foundation not set at proper elevation. Too high or too low an elevation to permit proper action or exposure of the slip base or break away coupler.
3. Improper backfilling or lack of mechanical tamping around foundation may result in eventual tipping of the foundation and pole.
4. Failure to grout under the base of pole. Note: 4 bolt slip base bolts and break-away steel neck couplers should not be grouted.
5. Failure to insure skirts are installed on breakaway coupler installations.
6. Improper placement of structural concrete per section 502.03 (exceeding max 5 ft. drop)

C. Pole Erection

1. Failure to accurately plumb poles after all hardware is in place.

D. Expansion Fittings

1. Failure to install a proper conduit expansion unit at structure expansion joints.
2. Failure to provide expansion couplings on long runs of plastic conduit may result in buckling of the conduit.

E. Wiring

1. Failure to use a wire lubricant prior to pulling through conduit may damage the wire, its insulation, or the conduit.
2. Use of extreme force and speed to pull wire such as with a vehicle may damage wire, its insulation, or the conduit.
3. Unauthorized splices in buried or concealed junction boxes that create future maintenance problems.
4. Failure to use insulated bushings at conduit entrances to metal junction boxes, cabinets, etc. will scuff insulation from the wire when it is pulled.
5. Use of wrong type or size of wire or wire with improper insulation.
6. Failure to use specified wire connectors or wiring methods, approved for the application per the NEC.

F. Grounding

1. Failure to connect poles, junction boxes and other equipment to the service ground by an insulated AWG 8 soft-drawn stranded copper wire.

14-Day Field Test

It is the intent of this specification to provide two weeks of standard operation with photocell, manual, or other specified turn-on control. During this test, the Contractor shall be responsible for all corrective work resulting from improper installation, workmanship or materials. Following successful completion of the test, the Engineer should recommend partial acceptance covering illumination. The cost of power consumed during the test period should be borne by the agency or agencies assigned maintenance responsibility by the cooperative project agreement.

Documentation for Pay Quantities

The diary shall be used to verify the activity, date, and location of the work and the final pay quantities.

Reports

None.

620.00 PLANTING

Landscaping, wetland mitigation and native and wildflower plantings are several areas where construction personnel may become involved with planting vegetation. With an increasing emphasis on the environment, including promoting and preserving biodiversity and enhancing natural beauty and aesthetics, the Department must take positive measures to preserve and restore natural landscapes that have been disturbed by development whenever possible and to achieve desirable results.”

Landscaping and Wetlands

The Senior Environmental Planner in the District shall have landscape and planting experience, shall be familiar with the recommended practices and procedures for planting trees and shrubs and provide guidance early in the project and at the time of planting. Projects with landscaping and/or wetland mitigation typically contain contract specifications with a minimum plant establishment period, usually one year.

Trees and shrubs come in various forms i.e., containerized, balled, bare root, and cuttings. The various types of plants require special attention in both in handling and planting. Plants shall be inspected prior to purchase to insure plants are robust and in healthy condition before planting.

Prior to planting, a thorough examination should be performed by the Contractor on all trees, shrubs, grass and native forbs, etc. to ensure they meet compliance and design specifications. The root system of bare-root plants shall be examined and any broken or damaged roots shall be cut off cleanly.

After the original planting, appropriate District personnel shall periodically inspect the condition of plants and planting areas to ensure successful planting and plant establishment. The Engineer will inspect the plants periodically and notify all responsible parties of apparent defects, faults and conditions, and dead plants discovered by the inspection. Correction of apparent defects, faults and conditions, and the removal and disposal of dead plants shall be completed within 10 days after notification. Dead or damaged plants shall be replaced at the earliest suitable time. Plant replacement shall not be postponed until the end of the establishment period.

If immediate replacement of dead or rejected plants is impossible due to seasonal conditions or because specified plants are unavailable, a marker should be placed at the spot of replacement (if necessary) and replacement shall be made during the next planting season.

Native Plants and Wild Flowers

A landscaping project involves any action taken as part of a highway construction project or as a separate action to enhance the aesthetics of a highway through placement of plant material consistent with a landscape design. States are encouraged to plant native wildflowers and native grasses, trees, shrubs, etc. on highway projects as part of erosion control measures, wetland mitigation or restoration, and/or as a total vegetation management program. All work performed in association with landscaping shall be included in the total landscaping expense. This applies to all projects with a landscape, seeding and/or planting design plan.

Guidance information (Fig. 14-528.1) has been included in the Design Manual and provisions for native plants or wildflowers shall be incorporated into each landscape project (including roadside seeding and plantings) unless a waiver has been signed.

Documentation for Pay Quantities

The diary shall be used to verify the activity, date, and location of the work. Quantities will also be documented in the diary.

Reports

- Construction Inspection Reports: ITD-1406 and ITD-2802 may be used as needed.

621.00 SEEDING**Seed Supply and Ordering**

When seed is to be supplied by the State it should be available at the Supply Services Warehouse. Order seed using an updated and unnumbered form ITD-2379. The most recent version of the order form shall be prepared and routed to the District Supply Operations Supervisor or appropriate source, prior to submitting the unnumbered form to the Roadside Programs Coordinator for final entry and approval. The following is a set of guidelines to be used when preparing an order.

- Use one ITD-2379 blank form for ordering seed. Do not include any other items except seed on this form. Use a separate ITD-2379 for each project.
- On the ITD-2379, fill in work authorization number (project code), function (or task) expenditure type and organization code, (these codes change periodically and should be filled in by Roadside Programs Coord.), description of seed species, unit of measure (in pounds), and quantity needed. Use appropriate rule codes from TRMS coding manual for all projects on State or local systems. Provide project name and number including key number, and a short description or project location under the comments field.
- Calculate the pounds for each kind of seed species (grass, forbs, and shrubs) needed and add 10% to the amount. Round quantities for each grass seed species to multiples of 50 lbs. (22.68 kg), legume seed species to multiples of 10 lbs. (4.54 kg), and shrub or forb seed species to multiples of 5 lbs. (2.27 kg). Record these quantities on ITD-2379.
- If native seed is desired or specified, contact the Roadside Programs Coordinator for assistance in species selection and quantities. Record pounds for each native seed species requested on ITD-2379 following the legume species list. Quantities of native seed species shall be calculated in multiples of 5 lbs. (2.27 kg) in most instances.
- Use correct name and identifier symbols or codes, as shown in the ITD Roadside Revegetation Guidebook in conjunction with the Design Manual and seed supply listing obtained from Supply Services Warehouse. **Do not** insert ITD catalog numbers.
- Give your best estimate as to date by which you need the seed delivered. Order seed a minimum of 30 days in advance of desired delivery date to ensure order is received in a timely manner. It is best to allow more time if possible, but do not order seed more than 3 months in advance.

- After completing the information on the unnumbered ITD-2379, except for Activity Code and Supply Catalog numbers, route the ITD-2379 to the District Supply Operations Supervisor. The District Supply Operations Supervisor will send the order to the Roadside Programs Coordinator for approval, retaining a copy for District Supply files. The Roadside Programs Coordinator will assign a K document number on the ITD-2379 and sends to Supply Services for data entry. The Roadside Programs Coordinator will return copies of the ITD-2379 to the District Supply Operations Supervisor and Resident Engineer after approving the form.
- Return all unused seed appropriately labeled and in original unopened bags to District Supply. A credit will be made to the original purchase code charging the project, and the District Supply General Inventory Account will be debited. Do not return any containers or bags of mixed seed or any open bags containing unmixed seed. All mixed seed left over or seed left in opened bags or containers shall be transported to the District Maintenance Section and documented on ITD-500. Document the quantities transferred to Maintenance on form ITD-500, Inter-department Correspondence.

Seedbed Preparation

Seedbed preparation includes weed control and soil conditioning which are vital for successful seed sowing and long-term plant establishment. Areas to be seeded shall be maintained reasonably free of weeds by mechanical means or application of appropriate chemicals until seeding time. All weeds shall be kept from going to seed.

Slopes that are 2h:1v or steeper are best addressed by hydroseeding or broadcast seeding. Areas to be broadcast seeded shall be roughen and cultivated immediately prior to seeding at a minimum depth of 2 in. (50 mm) and shall be left in a rough condition, similar to that obtained by walking a crawler tractor up and down the slopes in a perpendicular direction to slope contours. Where slopes are benched or serrated, no additional preparation will be required. Reference the ITD Erosion and Sediment Control Manual as needed.

Frequently, cut slopes are too hard and too smooth to obtain adequate seed coverage from the sloughing of the soil. Cut or excavated slopes steeper than 2h:1v may be constructed with stair-step or serrated conformation (terraces or benches) to encourage vegetative growth and establishment. The steps or serrations shall have approximately 1-2 feet (300-400 mm) vertical dimension with horizontal dimensions to fit the slope. Steps or serrations shall follow approximate contour lines and not be constructed on slopes containing soil types that are sandy, rocky, noncohesive or highly erodible, or in soft rock laminations.

Slopes that are 3h:1v or flatter and areas without excessive rock, gravel, or hardpan soil are best addressed by drill seeding. Soil shall be roughened using normal tilling methods and shall be cultivated to a minimum depth of 3 in. (75 mm). The soil shall be worked to obtain a desirable surface that will permit proper operation of drill seeding equipment. When using ripper hanks or scarifiers, serration intervals shall be set to 3 feet (1 meter) spacing width and 12 inches (300 mm) deep. Unless otherwise specified, seed, fertilizer, and mulch shall be applied in separate operations, one following the other in this order, except fertilizer may be applied with a fertilizer attachment at time of seeding or with water when watering is specified. Tillage and drilling shall be performed cross-slope (horizontal) and furrows shall remain open.

Constructed or excavated slopes 3h:1v or flatter that includes topsoil application shall be roughened and serrated and/or cross-rippled horizontally to the slope, prior to placement of the topsoil. After topsoil has been spread, the surface shall be prepared for seeding as specified above.

On areas subject to severe erosion, the extent of seedbed preparation shall not exceed the area on which the entire seeding and mulching can be applied within a one-day operation. If conditions occur that prevent seeding in appropriate furrows, i.e. depth according to size and dimension of seeds, or if the roughened condition is destroyed, the Contractor shall prepare the seedbed again.

Weed control is part of the seedbed preparation to keep weeds from going to seed and to reduce weed growth and spread from interfering with seeding operations. Weed control shall commence after weed seeds have germinated and plant growth is noticeable. Immediate action shall be taken on existing weeds to control and prevent additional weed seed production. Method of control, appropriate application, and timing are essential for best results. One treatment may be sufficient if these conditions are met. To determine the most appropriate or best method of control, mechanical or chemical application, contact the District Vegetation Foreman or the Roadside Programs Coordinator for assistance.

Weed control is best achieved when applied after the last early season rain and before weeds reach blooming stage. This normally occurs between May and July depending on the region or area.

Weed control is the responsibility of the Contractor and is not considered an extra expense. The method of weed control will require prior approval from the Engineer. If additional weed control is necessary due to Contractor error and/or failure to appropriately seed the areas during the specified seeding season (as required in Section 621) the costs of additional weed control shall be the responsibility of the Contractor.

Broadcast Seeding

Areas to be seeded that are not practical for drill seeding methods may be broadcast using hydro-seeder or dry broadcasting equipment. It was found that some broadcast seeding methods that combined wood fiber, seed, and fertilizer into one broadcast operation, resulted in higher failure rates. The fiber seems to attach tightly to the soil particles and provides a barrier to prevent temperature and moisture penetration. There is greater moisture lost under the fibers than in areas where the seedbed was properly prepared without mulch. In areas where wood fiber and seed were mixed together, most of the seed was found suspended in the fibers above the soil where germination is impossible without high moisture conditions. When fertilizer was included in the mix, a greater number of seeds were found burned in the mix. Therefore, seed, mulch, and/or fertilizer shall be applied in separate applications. Seed shall be applied to the seeded area first followed by mulch and/or fertilizer applications second. Agitation of seed in hydro-seeder shall not exceed 30 minutes due to an increase in seed damaged by the hydroseeder if seed is circulated over 30 minutes.

If certain conditions exist such as soils that are too hard or smooth and which prevents adequate seed cover or soil is too loose to adequately hold moisture near the seed long enough for germination to take place, then alternative actions or methods should be considered and a change order initiated if applicable.

Broadcast rate includes number of seeds distributed per square-foot (square-meter) of surface area. Generally, broadcast seeding requires more seed per acre (hectare) than for drill seeding.

Poor sites such as south and west-facing slopes require more seed than favorable sites; and the upper portions of the slopes should receive more seed than the lower areas on the slope. The number of seed required depends on the type of seeding method used. The following is a list of seeding methods ranged in order of low quantity of seed required to high quantity of seed required: drilling, whirlwind broadcast, hydro-broadcast, and aerial broadcast.

Drill Seeding

Proper drill seeding techniques are important in obtaining successful seeding. Most drill seeding failures are results of improper seed placement in the soil such as too deep, too shallow, or in areas that limit the amount of moisture received thus reducing moisture accumulation near the seed. Several factors affect seed establishment including improper seedbed preparation, incorrect disc spring pressure, failure to use appropriate depth gauges, improper drill or drilling speed, or drilling when wind is too strong.

The seedbed shall be prepared and soil loosened enough to allow disc to penetrate the soil, yet still maintain appropriate depth control. Drill rate shall be accurately calibrated which includes proper row spacing and number of seeds (quantity) distributed per foot (meter) or row length. Drill rows shall be spaced no wider than 6-7 inches (150-175 mm) since wider spacing encourages weed competition and delays stand establishment.

Disc spring pressure should maintain appropriate depth control; however, in some cases, depth gauges may be necessary to compensate for limited spring adjustments. Fast drill speeds and/or high winds can contribute to seeding failures by leaving seed on the soil surface instead of burying the seed underneath the soil.

A double-disc drill with agitator is required when mulch is not included. The drill shall be properly adjusted and operated so that the seed is placed at the bottom of small, cross-slope furrows approximately 2 inches deep (50 mm), with minimal soil covering. Furrows should be set according to the size and dimension of the seed which is shaped by the double-disc openers. Depth of soil covering the seed shall not exceed ½ inch (12 mm) and furrows shall be left open. Drag chains are not acceptable and shall not be used. If the furrows are constructed properly and seed is accurately placed at the bottom of the furrows, the wind and water from the sloughing of the soil should adequately cover the seed.

If mulch is used, the type of mulch and method of application shall be specified. Mulch shall be an approved product and certified by an authorized agency as “noxious weed free.” Mulching shall not be performed when wind interferes with mulch placement. Straw, grass hay, compost, wood fiber, soil amendments (or mulch mixture) or any combination of these materials shall be applied uniformly and as directed. All material applied to the ground shall allow for the absorption and percolation of moisture.

When mulch is used, cross-slope furrows should not be too deep and should be mechanically anchored into the soil. Where grain straw or grass hay is to be anchored by mechanical crimping it shall have approximately 50 percent of the stems exceeding 10 in. (250 mm) in length. Furrows shall be deep enough to hold the seed in place, with maximum soil coverage of ½ inch (12 mm), until mechanical anchoring is completed. This will provide additional seed cover. Mechanical mulch anchoring shall be completed on slopes 3:1 or flatter. Mulch shall be anchored into the soil by use of a heavy disc with flat scalloped discs approximately ¼ inch (6 mm) thick, having dull edges and spaced no more than 9 inches (230 mm) apart.

Anchoring shall be to a depth of at least 2 inches (50 mm) with no more than one pass of the equipment on the same surface. All mechanical anchoring shall be done horizontal to the slope.

Seeding shall not commence when wind interferes with seed placement as determined by the Engineer. Drill spacing shall not exceed 9 inches (230 mm). Legume seed shall be seeded through a separate box from grass seed, with seed spouts out, or broadcast ahead of the drill. Native seeds in the mix shall be broadcast immediately ahead of the drill. Seed shall be thoroughly mixed before placing in the drill or seeder box.

The goal is to place the seed under enough soil with adequate provisions to hold moisture. Both the furrows and the mulch serve to accumulate moisture. Once the drill is adjusted, monitor the drill speed, wind conditions, and free-flowing spouts. If the drill is not equipped with an agitator and the seed bridges over, correction can be made by properly securing baling wire to the drill box and monitoring seed dispersal.

Areas to be seeded that contain intermittent rocky areas may be broadcast seeded by raising the drill while going over the rocks allowing the seed to disperse out. As the drill discs are raised high enough to clear the rocks and the seed delivery system remains in gear, this allows the seed to disperse over the rocks. If this method doesn't work or the drill cannot be raised high enough to clear the rocks, then the seed should be broadcasted by hand or by some other broadcast method. Drilling in or around rocks should be avoided where equipment may be damaged. No equipment shall be driven over the area after seed is in place.

Mulch Anchoring

For slopes 2h:1v or steeper, a mulch tackifier should be used to help anchor the mulch. Mulch anchoring (tackifiers) shall be a material that bonds mulch together in such a manner that it will prohibit the mulch from washing or blowing away after application. When cured, the tackifier shall not be re-emulsifiable. The tackifier shall be soluble (mixable) in water, nontoxic to animals, soil microorganisms, aquatic and plant life and not interfere with or impede seed germination or vegetative growth and establishment. The tackifier shall be applied in accordance with the manufacturer's written instructions and applied at a rate that is acceptable to the mulch, soil type, condition and degree of slope.

Mulch plus tackifier shall consist of premixed packaged wood fiber mulch with tackifier or wood fiber mulch plus tackifier added prior to application and shall be mixed in accordance with manufacturer's written instruction.

If applied separately, a method to differentiate between the tackifier and mulch material, by color or tracer material, shall be incorporated during tacking operations. Tacking shall not be done when wind interferes with tackifier placement.

The general rule in achieving good seed germination and growth is to lightly cover seed with enough moist soil for a two-week period when soil temperature is above 50°F (10°C). Survival of the seeding, after the seed germinates, depends on selecting the appropriate season for seeding and the correct seed mix.

Soil Amendments

Soil amendments shall consist of organic soil applied compost or manufactured organic soil amendments. Compost shall be a Class A compost that meets or exceeds US EPA 40 CFR #503 Regulation, Standard Specifications for Classification Type I and pass a Solvita Maturity Test of 5 or greater.

Manufactured organic soil amendments and/or soil biological stimulants shall consist of organic materials, nutrients, and minerals that show the propensity and performance to facilitate and sustain the germination and growth of vegetation.

Mulch Mixture

Mulch mixture shall consist of mulch, soil amendments, soil biological stimulants, soil microorganism inoculants, bonding fibers, tackifiers, and/or other erosion control and plant nutrient ingredients as specified. Mulch mixture shall be premixed using the specified products and rate, and shall be hydro applied in one operation.

Erosion Blanket

For slopes 2h:1v or steeper, an erosion blanket may be used to stabilize and protect the soil surface. Erosion blankets shall be a material that protects disturbed soils from raindrop impact, surface run-off, and soil erosion. Erosion blankets may consist of either a pre-manufactured roll (biodegradable or synthetic) or a bonded fiber matrix or liquid mixture sprayed onto the soil surface. The type of blanket shall be as specified or approved and shall be installed according to the manufacturer's recommendations or as directed.

The rolled erosion blanket shall be placed with fibers in contact with the soil over the entire area covered. The blanket shall not be stretched taut. The blanket shall be anchored at joints, corners, and along the edges. Blankets on slopes shall be installed vertically to the slope. The blanket edge along the top of the slope and the ends of adjoining blankets on the slope shall be buried and anchored in an approved manner to prevent slipping or displacement of the blanket. The sides of adjoining blankets shall be overlapped, in the direction of water flow. Blankets used in ditches or channels shall have a minimum width of 3 ft. (1 m) Blankets shall be anchored and overlapped in an approved manner so water will neither flow under nor displace the blanket. Adjoining blankets shall be overlapped in the direction of water flow or as recommended by the manufacturer.

The liquid erosion blanket mixture shall be soluble in water and nontoxic to animals, soil microorganisms, aquatic and plant life and not interfere with or impede seed germination or vegetative growth and establishment. The mixture, as well as mixing and applying the mixture, shall be in accordance with the manufacturer's written instruction and applied at a rate for the soil type, roughness of surface, conditions and degree of slope.

Fertilizer

Fertilizer type and application shall be as specified. Fertilizer may be either broadcast (wet or dry) or drilled. For drill seeding method, it is preferable to place fertilizer with the seed at time of drill seeding by use of a fertilizer attachment whenever physically possible. For broadcast seeding method, it is preferable to apply fertilizer as a separate application after seeding. Fertilizer may be applied as dry ingredients or thoroughly mixed in a liquid mixture. Fertilizer may be applied with irrigation water as directed. When fertilizing established stands, fertilizer shall be applied when the average noontime temperatures are 60°F (16°C) or lower. Fertilizer shall be certified by authorized (or approved) agency and declared or certified as "noxious weed free" prior to acceptance.

Watering

A temporary water delivery system shall be installed by use of either sprinklers or trucks. Water shall be applied by the cubic meter (acre unit) at the times directed. (A one acre unit constitutes application of 0.5 inch of water which will saturate the soil to a depth of 4 in. under average conditions.)

Pipe connections shall be kept tight to avoid leakage and washing. Sprinklers shall be maintained in proper working order. Should runoff begin, watering shall be stopped and the balance applied after earlier water has penetrated the soil. The standard application rate is 16,000 gallons/acre (150 m³/ha) and constitutes the amount of water which will saturate the soil to a depth of 100 mm under average conditions.

Inspection for 4 in. (100 mm) depth of saturation shall be made by excavating to a depth of 4 in. (100 mm) and observing for wetness. It is intended that the locations of inspection for wetness will be reasonable and not be on "slick spots" or in unrepresentative areas.

Seeding Season

Selection of appropriate seeding season is essential when developing roadside seeding plans and insuring successful seeding on construction projects. Even though other specifications may be established correctly, if the timing of the seeding is incorrect, then the seedlings will most likely fail. There is constant pressure on ITD to expand the seeding time and seasons when this work can be accomplished but the most suitable time for sowing seeds is usually a three or four week window. This information is very useful and should be followed when planning roadside seeding. The contract special provisions contain required dates for seeding based on average climatic and other conditions for the project location. The specifications allow for some adjustment of these dates as directed. The purpose is to provide a specific time for seeding on a given project so that the season falls within a few days earlier or later of the specified time. Any deviation from the specified dates shall be approved by the Engineer.

Seed Mixtures

The specified seed mixture normally includes selected grasses, legumes, some shrubs, and native forbs. Each species is selected because of its unique growth characteristics and/or special needs of the project. There are other definite reasons for using the specified mixtures such as mature height, seedling vigor and longevity, bunch-type grass, size of seed, site suitability, and species ability to integrate or interact with other species during and after establishment. Any deviation from the specified mixes, except for minor substitutions when filling out a seed order from supply, shall be approved by the Engineer.

Documentation for Pay Quantity

An activity log or diary shall be used to verify the activity, date, and location of the work. Payment shall be made based on planned quantities except for authorized additions or deletions unless otherwise noted. When the unit of measurement is based on planned quantity, Subsection 109.01 of the Standard Specifications should be reviewed. If the Resident believes the plans are in error, they should re-measure the area and adjust the pay quantity if necessary. The Contractor may also request a re-measure; and if the quantities are in error, they should be readjusted.

Pay Item	Pay Unit
Seedbed Preparation.....	Ac (ha)
Seeding.....	Ac (ha)
Mulching	Ac (ha)
Mulch Anchoring (Mechanical)	Ac (ha)
Mulch Anchoring (Tack).....	Ac (ha)
Soil Amendments	Ac (ha)
Mulch Mixture	Ac (ha)
Mulch plus Tackifier	SY (m ²) Ac (ha)
Erosion Blanket.....	SY (m ²)
Fertilizing	Ac (ha)
Provide Water Delivery System.....	Lump Sum
Watering.....	AU (m3)

Reports

None.

622.00 PRECAST CONCRETE HEADGATES

The headgate locations are usually the weakest part of the ditch if good backfilling is not performed. Care must be taken to provide solid bedding and proper backfill. Good, dense material, free of any organic matter, shall be used for backfilling the headgate.

Documentation for Pay Quantity

The diary shall be used to verify the activity, date, and location of the work and reporting quantities and final measurements. Right of way agreements generally dictate the number and location.

Reports

None.

623.00 CONCRETE SLOPE PAVING

Concrete slope paving is subject to undermining and concentrated flows of run-off water along it's' edges resulting in erosion. Care should be taken during construction to ensure all drainage and run off water is directed in a manner that will protect the slope paving.

Documentation for Pay Quantity

The diary shall be used to verify the activity, date, and location of the work and reporting quantities and final measurements.

Reports

None.

624.00 RIPRAP

Riprap shall be placed to the dimensions shown on the plans and typical sections. Refer to the Standard Specifications if thickness is not shown on the plans. Slopes and toe trenches that will receive the riprap must be approved prior to placement of the stone. It may be necessary to cross-section or take three-dimensional measurement of the slopes and toe trench prior to placement of riprap to determine whether or not deficiencies exist in thickness or height. Riprap shall be computed from the staked dimensions.

Types of Riprap

Riprap has several types:

- **Loose Riprap and Hand-Placed Riprap** -- Rock taken from the project excavation can be used, if it meets specifications and is permitted by the Engineer. This material will be paid for as excavation and riprap. However, this material shall be replaced by the Contractor at no expense to the State when the excavation is needed for project embankments or other similar requirements. The swell of the rock and shrink of the borrow must be taken into account when computing the replacement quantity. Subsection 104.07 of the Standard Specifications should be consulted when the above circumstances occur.
- **Sack Riprap** -- This item will be produced using Class 15 (10 MPa) concrete. Care shall be taken to prevent placing in freezing weather if in a wetted condition. The concrete may need to be placed in the sacks in a dry state and dampened in place.
- **Concrete Stabilized Riprap** -- The type of concrete used to cover the riprap should be shown on the plans. No concrete shall be placed during freezing weather, and care shall be taken to protect the riprap from damage.

Make sure that the source for riprap is approved. Avoid haphazard dumping which may result in segregation. The finished riprap should be well keyed and present a regular surface having mass stability. Additional guidance may be obtained from the Hydraulic Engineer in Headquarter of Roadway Design.

Documentation for Pay Quantities

Riprap, concrete, and structure excavation shall be calculated on a computation sheet or the diary. The diary shall be used to verify the activity, date, and location of the work. Quantities shall be computed to 0.1 of a cubic yard (0.1 cubic meter) and rounded off to the nearest cubic yard (cubic meter) on the estimate.

Reports

Concrete Delivery Ticket, DH-70, is to be completed for each truckload of concrete (see Concrete Manual for example). The ITD-25 Diary can be used to document other rip rap quantities. See Section 502 of this manual for further details about concrete usage.

625.00 JOINTS

Joints in structures or concrete pavements and the related fillers normally consist of one of the following types:

Construction Joints -- are provided to enable the Contractor to perform the work in reasonable size increments. When placed in a structure, metal reinforcement or dowel bars normally extend across the joint to tie the sections together. A vertically formed bulkhead must be used to hold the concrete to grade and provide resistance for consolidation. If a construction joint is not shown on the plans, then the Bridge Section (for structures) or the Materials Section (for pavements) should approve its location. Construction joints placed in concrete pavements may or may not require the placement of reinforcing steel or dowel bars depending on the design or location.

Contraction Joints -- allow for contraction or shrinkage of the concrete. When concrete sets, a small amount of shrinkage occurs and results in a tension stress that causes the concrete to crack. To achieve a more pleasing surface appearance in the finished concrete pavement, contraction joints are placed, tooled, or sawed at predetermined intervals. The theory is that the concrete will then crack in straight lines at the predetermined joints. To keep foreign matter from wedging into the preformed or sawed joints, they may be filled with a sealer or filler. Tooled joints, such as used in sidewalks, are not sealed; but the tooled joint must be of sufficient depth to control cracking. When the depth of a contraction joint is not specified, the general rule is that it should be at least one-third of the depth of the section of concrete.

Expansion Joints -- provide a clear space into which the concrete can expand or contract without damaging or distorting adjacent material. Expansion joints allow for the expansion and other movement of bridge decks, curbs, sidewalks, etc. They are normally filled with a sealer, pre-formed expansion joint filler, or compression seal. The filler or seal must be firmly

secured to the face of the joint or the action of the joint opening and closing will eventually work the material out of the joint. Expansion joints sometimes have dowels to tie the joined sections together. The portions of the dowels that are to allow movement must all be parallel and in the same plane. Improperly installed dowels will actually work as ties and prevent movement rather than allow movement and results in cracking of the connected sections. It is not important as to which end of a dowel is fastened and which end is free to move. Good practice is to have the fixed end of the dowel in whichever portion of the structure is poured first. This practice will allow minor alignment of the expansion end after the dowel is firmly held by the first pour and, thereby, insures proper positioning.

Expansion joints may also have "waterstops" installed to prevent water from flowing through the joint. The waterstop should be carefully installed and bonded into both panels being joined. It must be continuous for any particular joint to form a completely waterproof barrier.

Polymer silicone or similar sealers - rely on their bonding properties to maintain the position in the joint. The joint surface must be clean. Sandblasting is one of the best methods to insure a clean surface.

Elastic joint fillers - are cellular in cross-section and are of a rubber-like material. The elastic joint fillers normally come in coils or rolls and are inserted into the carefully prepared joint with the aid of a lubricant. Care must be exercised not to overstretch the filler. This joint material works best when kept in a state of compression and for this reason it is best inserted during colder temperatures when the joints tend to be more open.

Documentation for Pay Quantities

The inspector should keep proper records as to lot, joints sealed, surface conditions, and temperature. The cost for these items is included in the contract prices for structure or pavement items. The diary shall be used to verify the activity, date, quantity (if applicable) and location of the work.

Reports

None.

626.00 CONSTRUCTION TRAFFIC CONTROL DEVICES

General

Use of construction traffic control devices shall meet the requirements of the current Manual on Uniform Traffic Control Devices (MUTCD) as adopted by the State.

The Contractor shall furnish all construction traffic control devices as shown on the plans, required by the Engineer, and as described in the MUTCD. In addition, all traffic control devices must meet the requirements of NHCRP 350 for crashworthiness so they are not a hazard to the traveling public.

The MUTCD for Streets and Highways, published by the Federal Highway as adopted by the State, establishes the design and application of traffic control devices on all public roads in Idaho. Included in the MUTCD are requirements for traffic control devices to control and guide traffic through or around road and street construction, maintenance operations, and utility work.

Normal design procedure is to establish pay items for certain types of traffic control devices on construction contracts. However, the provisions of the MUTCD and Section 626 of the Standard Specifications apply to all construction, maintenance, and utility work regardless of the presence or absence of pay items established by the contract.

A Contractor's or utility company's operations can change from day to day or even more frequently. Therefore, the Engineer on projects where traffic interference is involved shall designate one person to work with the Contractor or utility company daily in coordinating and tailoring traffic control to fit the work in progress. This person should be a trained traffic control technician or supervisor and, as such, shall be familiar with all the construction traffic control requirements of the Traffic Manual, standard drawings, MUTCD and its supplements. The Contractor or utility company should also designate a Traffic Control Supervisor of comparable responsibility with whom the inspector can recommend, propose, and evaluate the solutions to traffic control problems. It is desirable to have the District Traffic Engineer review and approve long term traffic control schemes, detours, or especially critical traffic control problems.

The Construction Inspection Report (ITD-1406) shall be used to document conformity of the traffic control provided on the project to the plans, Traffic Manual, standard drawings, MUTCD, and any approved modification of the Traffic Control Plan (TCP) at the initiation of the traffic control operation and when changes are implemented. A nighttime review should be included to verify the visibility and adequacy of traffic control devices under the condition of darkness. Subsequent day and night reviews should be made by the Engineer or other qualified staff members periodically and the results documented in the project files using the ITD-1406.

Application of Traffic Control

The part of the MUTCD covering traffic controls for construction and maintenance operations establishes basic principles and prescribes standards for design, application, installation, and maintenance of the various types of traffic control devices. The persons responsible for establishing traffic control plans must be capable of using good judgment in the selection of applicable devices and then using them in accordance with the provisions set forth in the plans, by the MUTCD or as directed by the Engineer.

A well designed traffic control plan normally must satisfy three basic requirements: (1) sufficient traffic control devices must be provided in advance of the work area to adequately warn motorists; (2) adequate visibility and/or protection of the workers and work area must be provided; and (3) the motorist must be safely guided through or around the work area. Consistency in device selection will aid greatly in this effort.

The Standard Specifications, Section 626, provide that payment may be made if bid items are established for several types of traffic control devices, including signs, barricades, drums, tubular markers, vertical panels, advance warning arrow panels, traffic control signal, hazard identification beacons, and pavement striping tape and flexible raised pavement markers.. This specification, however, does not limit the types of traffic control devices for use on projects to the above items. Other devices may be desirable or even necessary. Note: weighted base devices shall include all weights required to retain the device in its' proper position and working order at no extra cost to the State. Some of these other devices are barricade warning lights, floodlights or other types of illumination, traffic cones, delineators, and orange flags to supplement important warning signs. Payment for these auxiliary devices may be provided under the item "Rent Incidental Traffic Control Item".

In addition, guardrail, including "W" beam and concrete rail, although not a traffic control device, has considerable value in some traffic control schemes to protect both traffic and work areas.

Condition and Maintenance

Regardless of whether a traffic control device is covered by a pay item or its cost is incidental to other items, only those devices which are in good condition and meet the requirements of the MUTCD and specifications for color, size, design, intensity, reflectivity, etc. shall be used on a project. It is important that once installed on the project, the devices be kept clean, in a good state of repair, and properly located and supported. Properly installed and maintained devices command the respect of motorists and greatly enhance the desired effect. Conversely, improper devices and sloppy maintenance have the opposite influence on motorists. The project should be reviewed to determine if traffic control is to be monitored on a 24 hour basis. If so it should be clearly specified.

Construction Signs**A. Reflectivity**

Sheeting on signs used for traffic control is specified to meet retroreflectivity requirements of either Class "A" or Class "B". Class "A" is enclosed lens retroreflective sheeting and is normally called Engineering grade. Class "B" is referred to as high performance and is much more reflective than Class "A". Class "B" sheeting can be identified by patterns within the sheeting. Class "A" sheeting is void of any such pattern. Generally, the sheeting for red and orange signs will be Class "B," and the sheeting for white regulatory signs will be specified as Class "A." All workzone traffic control devices including Black/Orange signs are required to have Class "B", Type III, High Intensity sheeting and a minimum required retroreflective reading as stated in ASTM-4956D. Regulatory Black/White signs are exempted from this requirement. Retroreflectivity readings may exceed minimum requirements, but at no time shall they drop below 75% (percent) of the initial reading for Type III, High Intensity sheeting as stated in ASTM-4956D. Questions regarding acceptability of retroreflective sheeting should be referred to the District Traffic Engineer.

B. Design

The Standard Highway Signs Manual and the MUTCD provides information on the design of the most commonly used construction/maintenance warning signs. Legends other than those shown in the MUTCD may be used provided that the signs shall be of the same shape and color as standard signs of the same functional types, and have been approved in the TCP. Symbols used on signs must be as provided for by the MUTCD.

All sign sizes, text, sign numbering and design must be as indicated in the ITD Sign chart unless approved by the Department prior to use. Sign sizes for standard signs are minimum allowable dimensions.

C. Position, Mounting Height, Location, and Spacing

These requirements are covered in the MUTCD and the Traffic Manual. Some clarification by the Engineer may be necessary regarding the requirements on mounting heights.

The MUTCD establishes basic mounting heights above road surface for primary signs at 5 feet (1.5 meters) for rural areas and a minimum of 7 feet (2 meters) for urban areas. These standards apply to all primary signs with the exception that temporary signs may be mounted on portable supports a minimum of 1 foot (0.3 meter) above the road surface unless otherwise shown in the plans or directed by the Engineer. Temporary signs shall be considered as ONLY those signs which are mounted on temporary supports and used in the workzone for a continuous period of less than three (3) days. Thus, if a sign is needed at a location for a continuous period of three (3) days or more, it must be mounted either 5 or 7 feet (1.5 or 2 meters) above roadway elevation in accordance with the MUTCD. The lower standard does not apply to Regulatory signs such as speed limit, stop signs, etc.

Signs that are left in place when they no longer apply are as much of a problem as not having a needed sign. They may, in fact, create more resentment by motorists than the latter condition. It is imperative that signs that no longer apply be removed; or if not in use for a period not to exceed two (2) hours, that they be covered or moved to a location at least 15-feet from the edge of the traveled way and laid flat to the ground when not required. The cover should be fabricated from material which is not a vapor barrier.

Covers such as plastic garbage bags can cause damage during warm weather to the plastic reflective sheeting mounted on the sign. Signs and sign supports that are not in use beyond the two (2) hour period shall not be allowed to remain on the roadway shoulder.

D. Flagger Signs

It is important that the proper sequence of signs precede the flagger position. The placement of warning signs needs to take into account the length of traffic backup rather than the location of the front of the vehicle queue. Then when the flagger is not required, the signs must be turned, covered, or removed.

Construction Barricades and Drums

A. Reflectivity.

All barricades and drums shall be orange and have white Class "B" retroreflective sheeting.

B. Function, Design, Construction, and Application.

These requirements are covered in some detail by the MUTCD. Some items, however, need to be emphasized:

1. Diagonal stripes on barricades shall slope downward in the direction traffic is intended to pass by the barricade, or in compliance with the MUTCD.
2. Drums or barricades should never be placed in the roadway without advance warning signs. Under conditions such as severe curvature, heavy traffic volumes, etc., it may be advisable to use flashing beacons on single drums or barricades and steady burning lights on a series for night use. All signs and battery operated flashing or steady burning lights shall ONLY be used on devices that have been crash tested and approved for the same configuration and use.

Traffic Control Signal

A. Traffic control signals shall meet all the requirements specified by the MUTCD.

B. Requires interconnection or daily time based synchronization to operate properly.

Flashing Beacons

The MUTCD includes several specific requirements on size, mounting, visibility, flash rate, and lamp wattages under Section 4. Do not confuse a flashing beacon, which normally operates on 110 to 120 volts, 60 Hz.A.C., with a battery-powered barricade warning light.

Advance Warning Arrow Panels

The primary application of this device is to assist in the diversion of traffic; i.e., lane closures on multilane highways and total diversion to an interchange ramp.

The specifications require these devices to be capable of 50% dimming for night operation. This is necessary to reduce driver disability glare that would otherwise result from the 12 to 15 lamps operating at full lamp voltage during hours of darkness.

Project plans will require the use of advance warning arrow panels for lane closures and diversions on multilane highways where the designers anticipated the need for this device. However, if the job conditions or Contractor operations later dictate lane closures or diversions on rural multilane roadways, a change order should be negotiated to establish the use and agreed price of this device. Very short time diversions and lane closures may not justify the use of advance warning arrow panels.

Temporary Pavement Marking Tape

The Standard Specifications adequately cover the materials requirements and application. The color of the pavement marking tape shall be in accordance with the color requirements for permanent pavement markings, which are summarized as follows:

- A. Yellow separates opposing traffic.
- B. White delineates the separation of traffic flows in the same direction.
- C. White is used for pavement marking legends and symbols.

The Resident should request the assistance of the District Traffic Engineer in laying out complex pavement marking schemes.

Temporary pavement markings that no longer apply must be removed immediately.

The specifications require marking of all new asphaltic surfaces, including leveling courses, scrub coats, ATB's, and surfacing courses on a daily basis. Unless provided otherwise, state personnel will be responsible for temporary markings on new seal coats and surface treatments. The markings shall be applied to seal coats and surface treatments immediately following brooming. Paint may be used in lieu of temporary pavement marking tape if the tape will not adhere to the surface.

No roadway shall be opened to traffic until proper pavement markings are in place.

Traffic Control Maintenance

The item "Traffic Control Maintenance" is provided on projects which include traffic control devices. This bid item complements other 626 items and is intended to pay for relocation and maintenance of devices not paid for or rented under other bid items, including incidental traffic control items, and costs associated with providing monitoring and surveillance of traffic control devices.

The traffic control plans and/or special provisions will specify the type of special monitoring and surveillance required if extra attention to these matters is considered necessary due to high traffic volumes, higher speeds, etc. The Contractor should not be expected to furnish personnel for this activity on a full time basis unless the plans and specifications explicitly include this requirement.

Regulatory Speed Control Zones

A reduced speed limit should be based on good judgment, experience, and evaluation of geometrics and should not be based merely on the idea that such action will somehow absolve the State or Contractor of any responsibility in case of accidents.

Prior to establishing reduced speed zones through construction projects, some important considerations should be evaluated:

- A. Is there another feasible and possibly better alternative than reducing the speed limit? Studies have indicated that generally fewer accidents are likely to occur if traffic can be safely accommodated at the prevailing speed limit.
- B. Based on previous experience, can a reduced speed limit be enforced by a reasonable or normal level of law enforcement?

- C. If roadway alignment is one of the factors involved in the need to reduce speed, has safe speed been determined by sight distance determinations and by ball bank indicator measurement on horizontal curves?
- D. Can the reduction in speed be held to a maximum of 10 mph (15 km/h) less than the normal posted speed?

Reduced speed zones are often appropriate due to roadway or lane constrictions, temporary surfaces, alignment revisions, construction activity interference, and numerous other reasons. *Transportation Board Policy B-12-03 and Administrative Policy A-12-03* gives the District Engineer the authority to establish special speed regulations through construction and maintenance zones on the state highway system. This is accomplished by letters signed by the District Engineer and directed to the District Lieutenant of the Idaho State Police and local law enforcement agencies stating the special construction zone speed limit, the location, the date it will become effective, and any special application (i.e., during working hours only). Copies of the letter shall be furnished to the Resident, District Files, Traffic Engineer, Construction Engineer, and the Contractor. Speed zone reductions shall be removed as soon as they no longer applies.

When the construction speed zone is removed, a follow-up letter from the District Engineer shall be sent to the law enforcement agencies informing them of the reversion to the normal speed limit.

Establishment of reduced construction speed zones on locally sponsored projects not on the state highway system shall be accomplished with approval of the appropriate governing body. These procedures shall be followed on all projects requiring special speed zones regardless of the origin of the request or requirement. Projects including detailed traffic control plans that show reduced speed zones shall be handled in the same manner as those projects on which speed zone requests originate on the job.

State-Furnished Signs

The specifications indicate that certain guide and regulatory signs will be furnished by the State. This is intended to apply to regulatory and guide signs which are presently installed within the project limits and the construction operations requiring relocation of these signs. However, because some guide signs are difficult to acquire on short notice, the State will also furnish temporary destination signs and route markers.

Traffic Control Plans

It is a Department policy that every highway construction project plan includes a construction Traffic Control Plan (TCP). The TCP will vary in complexity and impact on project costs depending on the type of construction and the speed and volume of traffic to be accommodated.

Department policies which mandate TCP's and key elements of those plans are as follows:

- A. *Administrative Policy A-12-04 Traffic Control during Construction, Maintenance, Utility or Private Development Operations*

Key elements of this policy regarding construction projects are as follows:

1. Public convenience must be considered on every project.
2. The movement of Traffic must be inhibited as little as possible.

3. Maximum delay to traffic should not exceed 10 minutes per stop nor 15 minutes total if more than one delay is necessary to move traffic completely through a project.
4. The construction Traffic Control Plan will provide, if appropriate, limitation of Contractors' operations during periods of peak traffic volumes.
5. Construction contracts shall include a comprehensive construction Traffic Control Plan that addresses the safety and efficiency of traffic, pedestrian, and bicycle movement during construction.
6. Any changes to the construction Traffic Control Plan requires the approval of the Engineer or his designee prior implementation.

B. Design Manual, Preliminary Design, Subsection 410-412, paragraph 14-412

These sections of the Design Manual set forth policy and procedures on TCP's. Among items covered and not discussed elsewhere in this manual are the following important points:

1. TCP's for interstate highway projects should provide for minimum interference with the free flow of traffic.
2. Stopping of interstate traffic shall be avoided and only considered in an emergency.

The above described policies cannot be enforced with the Contractor unless they are appropriately adopted by the contract. However, if the designers have neglected including provisions as required by policy or if contract changes are made that may require employment of the described policies, a change order must be prepared to incorporate provision of the applicable policies.

TCP's may be revised at the request of the Department or the Contractor to provide for a better or more efficient plan or to accommodate revised work or a Contractor proposal to pursue project construction in a manner different than anticipated by the designer. Major revisions in TCP's shall be accomplished only after a contract change order allowing the revision is approved. Alternate TCP's will be evaluated for acceptance on the basis of equality of safety and traffic accommodation and cost as compared to the originally planned TCP.

Documentation for Determining Pay Quantities

The diary shall be used to verify the location and type of temporary construction traffic control devices placed on the roadway.

Construction operations are not to begin until traffic control devices are approved by the Engineer.

No payment shall be made for devices which do not conform to the MUTCD. This would include, but not be limited to, installation height and spacing, reflectivity at night and sign face condition.

For ease in calculating it is suggested that the sign chart in the construction TCP list the square foot quantity of each sign. The ledger will summarize the total quantity of the item and reference the diary and charts as the source documents. Quantities shall be computed to 0.01 of a S.F.(1000 sq. mm) and rounded to the nearest 0.1 of a S.F.(10 000 sq. mm) on the estimate.

The inspector assigned to traffic control on the project should number and date each sign, barricade, or drum as it arrives on the project to aid in maintaining an inventory for payment.

As stated in the specifications, a traffic control device once paid for is available for use on the project(s) through the life of the contract, at no additional cost to the State, including for repairing or replacing it. The Traffic Control Maintenance item reimburses the Contractor for handling, etc., once the device has been employed.

If the Engineer approves removal of all construction traffic control devices from the project(s), and it later becomes necessary to reemploy some of the devices, the payment and inventory requirement become reinitiated. An example of this situation would be as follows:

Paving of a project is completed one year and seal coating is to be done the following year. If the Engineer approves removal from the project(s) of all devices upon completion of paving, it will be necessary to pay the Contractor the following year to provide the required devices. Therefore, it behooves the Engineer to evaluate traffic control device requirements on subsequent phases of construction prior to authorizing their removal upon partial completion of the project.

Furnishing of traffic control devices by a subcontractor or by the Contractor has no bearing on how payment under this item is to be administered.

The diary shall be used to verify traffic control maintenance, date and explanation of work performed. Tickets or ITD-370 or ITD-371 Weekly Force Account sheets would be acceptable documents on a daily basis. Regardless of the means of documentation, concurrence on a daily basis of quantities shall be verified by the Contractor's representative's initials along with the Engineer's representative's initials on the source document. According to the specifications, traffic control maintenance will be measured and paid for by the hours of authorized traffic control maintenance. Hours of traffic control maintenance shall be reported to the nearest 0.5 hour. Any overtime for traffic control maintenance has no bearing when reporting hours worked for Contractor payment.

When a flag person sets up signs, that period of time will be paid as traffic control maintenance. There will be no payment for flagging during that same period of time.

Reports

None.

627.00 PAINTING

Paint removal, disposal, and new painting specifications are changing because of environmental and personnel safety concerns. Field staff should thoroughly review each contract specification when involved in inspection of this type of work.

When the paint arrives at the job site, the inspector must check that the specified paint formula and system is being used.

Each District Materials Engineer has the "Pictorial Surface Preparation Standards for Painting Steel Surfaces," as well as the Steel Structures Painting Manual, Volume I, "Good Painting Practice," for reference material. Each District Materials Engineer also has a copy of Section 2, "Surface Preparation Specifications," from Steel Structures Painting Manual, Volume II. These three guides will be of great assistance in eliminating painting problems.

Painting must be performed under clean, dry conditions. Moisture on the surface will be trapped by the paint and prevent bonding. Moisture or dust in the air will cause a speckled or blotchy appearance. Cold weather also inhibits good bonding of the paint.

The new paint systems must be applied in accordance with the paint manufacturer's recommendations utilizing proper pressures, paint guns, nozzles, etc. Because of the quick drying nature of some paints, the gun must be held close enough to the metal to get the paint to the metal in a moist condition and thereby ensure a sealing coat. Several conditions of improper application, thinning, temperature (too high, too low), etc. can arise that will allow the paint to dry or be nearly dry upon contact with the metal. These undesirable conditions must be corrected immediately.

The painting must follow the sandblasting as quickly as possible. Generally, anything sandblasted one day should be painted with the prime coat the same day unless inside dry storage of the structural steel is utilized. If dew, rain, or other moist conditions dampen the near-white sandblasted steel surface, immediate rusting will occur, and the metal would require sandblasting again.

Inspection of steel that has been cleaned by sandblasting should verify that the surface meets the specified color or preparation. To ensure the proper thickness of paint on the steel surface, the dry film mil thickness shall be checked by means of a gauge or meter. The inspector should document where the depth checks were made and choose checkpoints so as to check all types of surfaces.

Painting of the concrete will be required when noted in the special provisions or on the plans or when initiated by change order. The concrete surface preparation shall be an "ordinary surface finish", as stated under subsection 627.03 (E) of the Standard Specifications. The concrete shall be cured by one of the methods designated under Subsection 502.03 (J) of the Standard Specifications. Painting will follow the manufactures recommendations for the best results.

Documentation for Pay Quantity

Painting will not be paid for separately unless otherwise provided. The diary shall be used to verify the activity, date, and location of the work and may be used for reporting final quantities when painting is a pay item.

Reports

None.

628.00 SNOW POLES**General**

Supplemental guidance to the Standard Drawing (G-4) for installing snow poles can be found in the 261 section of the Traffic Manual.

Documentation for Pay Quantity

The diary shall be used to verify the activity, date, and location of the work. Quantities will also be documented by diary entry.

Snow poles will be paid for by the "each" unless otherwise indicated with acceptance by the RE letter or as otherwise specified.

Reports

None.

629.00 MOBILIZATION

Mobilization is an item to reimburse the Contractor for monies spent to initiate the start of a project including: bonding, insurance, initial material acquisition etc.

Documentation for Determining Pay Quantities

Subsection 629.05 of the Standard Specification is quite explicit on how the Contractor is to receive payment for the mobilization bid item. This specification does not allow payment for mobilization to exceed 10% of the total contract amount until completion of the project work.

Reports

None.

630.00 FLAGGING AND PILOT CARS

Flag persons furnished by the Contractor to control traffic shall be trained using an ITD approved course and have a valid flag persons card on their person. Idaho's cards are valid for three (3) years from the date of issue. Currently the Department accepts all ATSSA cards and cards issued in Washington, Oregon, Montana and Utah (under a reciprocity agreement with these states) provided they have been issued within the **last three years**. The flag person's card shall be verified and documented by diary entry, recording the card number and the organization and state that issued the card.

Acceptable flagging equipment and attire, as described in the most current issue of the MUTCD as adopted by the State and the contract, shall be used. Care should be taken to reject all equipment deemed to be inadequate. A guide published by the ATSSA can be used to determine the serviceability of signs and some flagging equipment.

All pilot cars shall be equipped with the proper signing and mounting, as designated in the current MUTCD as adopted by the State, and be properly mounted. The vehicles used for piloting shall be in good running condition and be equipped with a roof-mounted, high-intensity, rotating or strobe type amber flasher visible to both oncoming and following traffic.

Documentation for Determining Pay Quantities

The diary shall be used to verify the activity, date, and location of the work. The ITD-370 or ITD-371, Weekly Force Account sheets would be acceptable documents for use on a daily basis. Other district generated forms are also acceptable.

Regardless of the means of documentation, concurrence on a daily basis of quantities should be verified by the Contractor's representative's initials along with the Engineer's representative's initials on the source document.

According to the specifications, flagging will be measured and paid for by the hour of authorized flagging and pilot car by the hour of authorized operation, i.e., if two pilot cars were authorized for six hours each, the pay quantity for that day would be 12 hours. Similarly, if two flaggers must flag traffic for an 8-hour period, payment is made for a total of 16 hours even though a third flagger may have been employed for relief. Hours that are authorized for flagging and pilot car operation shall not include show up time or standby time. Hours of flagging and pilot car operation shall be reported to the nearest 0.5 hour. Overtime for flaggers or pilot car operations have no bearing when reporting hours worked for Contractor payment unless they are being done separately under agreed change order conditions. Flagging paddle and pilot car operating time are by pay units, not payroll hours.

Reports

None.

631.00 CONSTRUCTION MAINTENANCE DURING WINTER SUSPENSION

If winter maintenance is required for a construction project, a pre-suspension meeting shall be held between the Engineer and the Contractor to determine the level of maintenance on the roadway during suspension. The equipment, work force, and materials necessary for the maintenance will be determined at this time. All equipment being used and paid for shall be available at all times and materials necessary for repairs shall be readily available.

All actual loaded labor costs to the Contractor for this work shall be paid for, including travel time (actual costs).

Payment for any work accomplished by a piece of equipment during a one-month period will not amount to less than the equivalency of 100% of the owner's monthly equity rate.

Documentation for Pay Quantities

The diary shall be used to verify the activity, date, and location of the work. Weekly force account sheets should be kept in duplicate and signed by both parties.

Reports

None.

632.00 REMOVAL OF BRIDGE DECK CONCRETE

Removal of bridge deck concrete can be complicated depending on project specific situations. Consult with the Bridge Section if there are any major issues or questions regarding procedures to follow.

Subsection 632 specifies requirements for removing concrete in the upper portion of the deck (Class A) followed by the selective removal of any remaining defective or deteriorated concrete (Class B). All exposed reinforcing steel must be cleaned and debris and water removed.

Prior to the Contractor beginning removal operations verify the following:

- All bridge drains have been plugged.
- Expansion joints and barrier curbs are protected.
- Milling of the overlay, if any, has been satisfactorily completed and accepted.
- The line separating deck sections where removal is not required (see plan sheets) has been saw cut “to a depth approximately 75 percent of the planned removal depth”. Note: care should be taken to avoid cutting any rebar.
- The hydro-demolition equipment shielding (typically rubber mats), used to prevent flying debris, is in good condition.
- Adequate protection (e.g. plywood sheets) has been provided to “protect the public from flying debris both on and under the work site”. Even when the equipment shielding is in good condition, aggregate and other debris can shoot out and travel quite a long distance.
- Provision for water and residual debris containment are adequate, and prohibited from flowing “into the vehicular and pedestrian traffic areas and into nearby waterways”, also including under the worksite. Verify that any temporary collection ponds are lined with an appropriate material.

CLASS A REMOVAL

Class A removal consists of the removal “of all concrete from the top surface of the deck over the area shown on the plans to the mean depth limits shown on the plans”. Removal may be accomplished by either hydrodemolition or mechanical means.

Prior to beginning Class A removal, a pre-operational meeting should be held with the contractor. Topics to discuss include:

- 1) Size and type of equipment to be used. Equipment should be able to make a series of equal passes to remove the requisite width and depth of concrete.
- 2) Containment of debris and water runoff.

- 3) Methods for disposal of removed material.
- 4) Manufacturer representation.
- 5) Methods to be used for measuring Class A and B removal quantities.
- 6) Contractor is responsible for depth of cut adjustments during Class A removal. Any work required because of over or under removal or deck “blow-outs” is at no additional cost to the State.

Hydro-demolition

Hydro-demolition involves the pressurization of water and the controlled delivery of a water jet to demolish the cement matrix between the concrete aggregate. It can attain a high production rate while removing concrete to the desired depth. The equipment consists of both a power unit and a demolishing unit. The power unit typically is housed in a large metal container on a flatbed trailer tractor. The demolishing unit is typically a microprocessor controlled wheeled vehicle equipped with a water delivery nozzle. High pressure water is delivered from the power units to the nozzle by flexible hosing. If a water source is not readily available a water supply truck is also required.

Do not allow any work to begin if:

- 1) A “*qualified full-time representative of the manufacturer of the hydrodemolition equipment*” is not present and available as required by the specification. The representative is required on site during trial area removal and until the work is progressing satisfactorily.
- 2) Documentation that the equipment “*is operated by qualified personnel trained by the manufacturer*” has not been provided.
- 3) The contractor does not have “*sufficient spare parts and service to maintain to maintain the operation of the equipment*”.

The contractor must satisfactorily demonstrate that the equipment, labor and methods of operations can achieve the specified Class A removal depth. The Engineer designates the location of the trial area and the trial area is then demolished until satisfactory removal (i.e. specified mean depth and as determined by the Engineer) is achieved. Reject any equipment and personnel that do not produce satisfactory results.

Locate the trial area within a uniform section of the deck that appears in good shape (i.e. “sounder” concrete where deterioration or delamination is not present). Also make sure the trial area is also not located in an area where previous patching is present. The patching material used typically has a significant higher strength than the original concrete and could result in an over-removal of Class A material.

Removal both above and below (e.g. when patches or delaminated concrete are encountered) the mean depth is expected for this type of work, is included in the contract unit price (for Class A removal) and is addressed in the specification:

- *“If the hydrodemolition removal extends beyond the mean removal depth where unsound concrete is encountered, it shall still be considered Class A removal and shall not be considered any work at additional cost to the state.”*
- *“Any concrete not removed to specified limits during hydrodemolition shall be removed by mechanical means.”* Again, this would be at no additional cost to the state.

These points should be emphasized to the contractor during the pre-operational conference.

The system operating parameters for Class A removal are established based on satisfactory removal of the trial area and is critical for ensuring that the mean removal depth is attained during production. The depth of cut is adjustable in several ways and includes: the rate of travel forward by the mill, the rate of traverse on the cutting arm, the size of orifice in the water jets and the angle of their attack. The depth of removal is normally adjusted using only one variable: the rate of travel by the forward mill. Document the trial area work in the construction diary and obtain a copy of the established operating parameters for the project files.

Verify that the equipment has begun moving prior to the actual removal. Monitor and document removal depths and overlap of equipment passes throughout production. Watch for areas of deteriorated concrete or patching. Some contractors try to reduce Class A patching removal and Class B removal requirements by setting the operating parameters higher than what is needed for the specified removal depth. This can result in an increase in deck “blowouts” because of excessive water pressure and increase the volume of material needed for the deck overlay. Patches frequently require removal by mechanical means because of its high strength. Verify that the contractor is adjusting for depth of cut appropriately during production. If not, stop work and discuss.

Also verify that the actual depth of the reinforcing steel is not higher than what is shown in the plans. The design intent of Class A removal is to take off the concrete surface that is above the top mat of reinforcing steel (though again some exposure is expected). The mean removal depth may need adjustment if the reinforcing steel was higher than what was shown in the plans.

Finally, ensure that the contractor is adequately supporting any exposed unsupported reinforcing steel following Class A removal and that it is protected from construction operations. Do not allow any equipment on unsupported reinforcing steel. Require the contractor to repair any damaged reinforcing steel. The approved repair method is at contractor expense.

Mechanical Removal

Class A removal by mechanical means is either by power operated diamond grinding machinery or jackhammers. Diamond grinding is used in lieu of hydrodemolition while jackhammers are normally employed for removal of patching material, other discrete areas that may be higher than the specified removal depth, and areas inaccessible to the hydrodemolition equipment.

If diamond grinding is to be employed, contact the manufacturer of the equipment to verify what equipment operating requirements are required for the specific project in question. Document the results in the project file.

Verify that equipment maximum ratings are not exceeded. See the specification for specific removal requirements.

Communicate to the contractor the specification requirement that: *“If any reinforcing steel is exposed...immediately stop work and request instructions from the Engineer.”* The Engineer should then evaluate the best method(s) for protecting the rebar from being damaged or de-bonded from the concrete. This may require changing the type of jackhammer bit or raising the grinder teeth to avoid nicking the rebar.

Runoff and Cleaning

The demolished concrete and water combine into a mixture of rubble; slurry and excess water, that must be contained and removed (See specification for containment and removal requirements). Do not allow brooming as an option for cleaning. Brooming does not effectively remove fine particles.

Ensure that the cleaning is timely (i.e. promptly follows removal) so that the material is not allowed to dry. If the material is allowed to dry it will adhere to the deck and become extremely difficult to remove. Regardless, the deck must be completely cleaned of all debris and water to ensure that a clean, bondable surface remains.

Cleaning of Exposed Reinforcing Steel

Also included in Class A removal is cleaning any exposed reinforcing steel of rust, scale and corrosion. This is necessary so that the new deck overlay material will bond with the steel. The hydrodemolition operation typically removes a majority of rust, scale and corrosion but the contractor may still have to employ additional methods such as sandblasting. Verify that the steel has been adequately cleaned.

CLASS B REMOVAL

Class B removal is comprised of removing: 1) localized areas of deteriorated concrete remaining after Class A removal, and 2) concrete around de-bonded reinforcing steel. Areas for removal are designated by the Engineer and should be clearly marked in the field. Verify that equipment maximum ratings are not exceeded. See the specification for specific removal requirements.

Remember, partially exposed reinforcing steel does not automatically mean it is de-bonded. Verify bonding conditions before requiring removal. Removal of concrete around bonded reinforcing steel tends to cause loosening ahead of the process and could result in excessive removal.

DOCUMENTATION FOR PAY QUANTITIES

Payment for both Class A and B removal is by area and require field measurements. Provide the Contractor with quantity computations regularly throughout the work. Quantities and computations can be reported via the construction diary, the pay item report or the ITD-404.

REPORTS

Document all discussions, work activities including locations and depth of removal verifications in the construction diary. Supplement with photographs and videos especially if there are any issues or irregularities that occur.

634.00 MAILBOX

General

Mail boxes and their supports must meet the Departments' minimum standards for construction as shown in the ITD Standard Drawings. ITD standard Drawings H-5-A,B,C reference mail box details. Mail boxes and newspaper appurtenances can be a safety hazard depending on the cross section dimensions of the highway, sight distance, the impact resistance of the support, traffic volume and if vehicles must occupy a portion of the travel way when accessing the mailbox.

If possible the mailbox and support should be erected with the following considerations in mind: (1) easy access in an area not exposed to traffic; (2) good sight distance in advance of the mail box; (3) be of the nature and type that do not present a hazard if struck by a vehicle or contain supports that break away safely if struck.

Mail boxes should be located behind guard rail if possible or outside the acceptable clear zone for the type of roadway involved.

Current postal regulations should be consulted for specific set-backs requirements applicable to the area and roadway type involved. Additional guidance on mail box installations can be found in the latest edition of *AASHTO's A Guide for Erecting Mailboxes on Highways*.

Documentation for Pay Quantity

The diary shall be used to verify the activity, date, and location of the work. Quantities will also be documented by diary entry.

Excavation and compacting backfill work related to the mailbox installation is considered incidental unless otherwise specified.

Reports

None.

640.00 CONSTRUCTION GEOTEXTILES**General**

The term Construction Geotextiles as used here applies to the broad category of textile type materials manufactured with the purpose of being used with soils, rock, earth etc. as part of an engineered structure or system. They may be manufactured from a variety of raw materials including synthetic polymers, glass fibers or natural fibers such as cotton, jute and other plant based substances. Those made from synthetic polymers of polypropylene, polyester, polyethylene or polyamides (nylon) are known as geosynthetics. However, the term geosynthetics is commonly synonymous with the phrase construction geotextiles.

Construction geotextiles typically serve one of the following primary functions: filtration, drainage, separation, reinforcement, fluid barrier and protection. Some may serve more than one function. Their applications are usually defined by their primary function. They are identified by one or more of the following: their general class, the type of material from which they are made, their method of manufacturing and select physical properties.

The four major sub classes of construction geotextiles or geosynthetics are: geotextiles, geogrids, geomembranes and geocomposites. The vast majority of geotextiles are classified as either woven or non-woven. Woven are typically natural materials manufactured similar to other cloth making processes and are characterized by high tensile strengths, high modulus and low elongation. Non-woven geotextiles are typically synthetic polymer fibers or filaments continuously extruded then subject to being spun, blown, needle punched, heat bonded, or welded into a textile layer. They are characterized by high elongation and permeability.

Geotextiles are generally permeable materials manufactured from polymers, fibers or yarns and combined into planar, textile structures. Geotextiles are typically used in filtration, drainage and separation applications. A typical application would be to prevent soils from migrating into drainage aggregate or stop sub grade materials from penetrating into the road base. They usually allow water flow through the system.

Geogrids are permeable layers of synthetic materials used primarily for soil reinforcement. Geogrids are manufactured by a knitting or weaving process similar to the non woven methods referenced above and then coated. They have larger apertures or openings which allow the fill material on either side to interact and interlock while allowing vertical drainage of free draining soils. Hence, they act primarily to add tensile strength to the soil matrix thereby providing a more competent structural material. They are common in the construction of retaining walls and in separation and stabilization application.

Geomembranes are commonly impermeable or low permeable materials used to act as fluid barriers and to affect a seal or separation of the adjacent layers. They are used in applications requiring containment, lining, capping and sealing.

Geocomposites consists of materials that can provide two or more of the above sub class functions. Geocomposites are often used as a substitute for conventional graded aggregate or perforated pipe subsurface drainage systems. Geocomposites such as geonets, sheet drains, pavement edge drains, and prefabricated vertical drains (PVD or wick drains) are used mainly for drainage. Geocomposites may be a single material or the same results can be accomplished using combinations of different materials together.

Construction Requirements

Field personnel must be properly trained to observe all phases of the construction.

Handling, storage and installation requirements must follow the contract provisions and the manufactures' written recommendations. Emphasis should be placed on ensuring material is not wrinkled or folded when laid out and the required overlaps are made. Geotextiles can be contaminated during placement so they will not drain, geogrids can experience broken grids which reduce strength and geomembranes can be punctured reducing their effectiveness as a water barrier. All seams, both factory and field, need to be checked for flaws. The inspector should note that care is taken to prevent void spaces behind or under the material and that good contact with the underlying layer is made. Also ensure that dumping damage does not occur during covering and construction equipment is not allowed to drive on the material until adequate cover has been placed over it.

For uniaxial geogrids check to ensure the strong direction, normally the roll direction, is placed in the direction as shown in the plans.

General questions should be directed to the manufacturer of the material or the geotech support units within ITD Materials. However, material and construction details changes such as those around penetrations and adjacent structures are highly dependent upon the design and any variations in these should only be done with the approval of the designer and documented by the Engineer.

Documentation for Pay Quantities

The diary should be used to note the activity date and acceptable completion of the work. Material description and lot numbers need to be checked to verify they match the contract requirements and the certifications which should come with the shipment. The material should be measured in the field and the pay item entered on the diary or the pay item report. Geosynthetics will be measured and reported to the nearest 1.0 SY (M2) of material in place less overlaps. Do not pay for material until certification is received.

Reports

Test reports as required per QA Manual Section 270.00

656.00 TRAFFIC SIGNAL INSTALLATIONS**General**

This work is very specialized requiring the services of a licensed electrical Contractor. Few inspectors have had sufficient experience to thoroughly and adequately inspect this type of work. To overcome this problem, it is recommended that the District Signal Electrician or electrician work closely with project personnel to assure plan and specification compliance.

Experience has proven that many potential problems can be averted or minimized by a special pre-operational meeting involving the electrical Contractor or subcontractor, project personnel, and the Signal Shop Superintendent or District Signal Electrician. This special pre-operational meeting should be held immediately prior to starting the electrical work. It is especially important that the Contractor's job Superintendent or Foreman attend this meeting. The conduct of the meeting should be informal and cover the real "nuts and bolts" problems that may be expected or that have occurred on previous projects.

Common Construction Errors

Over the years, a number of recurring construction errors have been discovered regarding electrical work either at final inspections or later when maintenance work was being performed. A list of these more common errors follows. This list is included as a reminder for inspection personnel and should not substitute for the pre-operational meeting where this list of errors should be presented and discussed with the Contractor.

A. Common Conduit Installations Problems

1. Use of plastic conduit for elbows greater than 45° instead of steel (as required) causing conduit to be cut when wire is pulled.
2. Minor bends in conduit without proper use of bending tool causing partial collapse of conduit and resultant problems pulling wire through conduit.
3. Use of rocky material for conduit backfill instead of fine soil/sand results in eventual collapse of conduit.
4. Failure to clean dirt and moisture from conduit prior to pulling wire.
5. Failure to cap stub/free ends of conduit resulting in intrusion of soil and moisture.
6. Conduit buried at less than required 24 in. (0.6 m) depth causing future maintenance problems, such as inadvertent cutting or mashing of conduit.
7. Placement of conduit by other than a certified licensed electrical Contractor. This can result in rejection by the State Electrical Board.
8. Placement of conduit at locations other than shown on the plans without proper indication on the as-constructed plans.

B. Common Foundations Problems

1. Improper or wrong size anchor bolts installed or installed out of alignment for proper pole base plate fit.

2. Foundation not set at proper elevation.
3. Improper backfilling or lack of mechanical tamping around foundation may result in eventual tipping of the foundation and pole.
4. Failure to grout under the base of pole.
5. Improper placement of structural concrete per section 502.03 (exceeds 5 ft. max drop).
6. Improper size of signal cabinet foundation installed. This is a common problem with projects that have multiple signal installations and it is assumed that all cabinets take the same foundation.

C. Common Pole Erection Problems

1. Rotation of signal mast arm 180° from designed position resulting in a drooping instead of a raked appearance.
2. Failure to accurately plumb poles after all hardware is in place.
3. Failure to properly tighten fasteners.
4. Failure to clean or chase internal threads, prior to component attachment.

D. Common Expansion Fittings Problems

1. Failure to install a proper conduit expansion unit at structure expansion joints.
2. Failure to provide expansion couplings on long runs of plastic conduit may result in buckling of the conduit.

E. Common Wiring Problems

1. Failure to use a wire lubricant prior to pulling through conduit may damage the wire, its insulation, or the conduit.
2. Use of extreme force and speed to pull wire such as with a vehicle may damage wire, its insulation, or the conduit.
3. Failure to pull signal cable by hand may damage insulation due to the sharp bends normally required in signal installations.
4. Unauthorized splices in buried or concealed junction boxes that create future maintenance problems.
5. Failure to use insulated bushings at conduit entrances to metal junction boxes, cabinets, etc. will scuff insulation from the wire when it is pulled.
6. Unauthorized splices in signal cables (signal head wiring, video or loop detection). The specifications allow no splices, as splices are a common source of problems in signal installations. The cable must be continuous between terminal connections.
7. Use of wrong type or size of wire or wire with improper insulation.
8. Failure to use approved wire connectors and insulated splice kits.

F. Common Signal Loop Wiring Problems

1. Improper splicing of signal loop detector lead-in wire which may break down causing moisture to enter the splice and ground the loop making it inoperable.

2. Improper use of shielded conductors for loops.
3. Use of a loop lead-in wires other than the approved type.
4. Allowing the Contractor to use a sharp instrument, such as a screwdriver, to force loop wire into the sawed slot causing damage to the wire or insulation.
5. Use of a tar or asphalt sealer which are not approved for use on loops and splices.
6. Use of non-approved loop sealant.
7. Slots sawn for loop detectors, not wide enough for proper embedment in sealant.
8. Loop system testing not being recorded and certified on ITD form #2698

G. Common Video Detection Problems

1. No site review by manufacturer's representative(s).
2. Improper field of view set in camera.
3. Improper detection zones in configurations. Must be per the detector loop spacing plan (Standard Drawing I-5.)
4. No consideration for seasonal low sun angles.
5. No follow up to confirm operation during dusk to dawn operation.

H. Common Interconnection Problems

1. Fiber optic interconnect system is not properly installed to control minimum bending requirements of fiber optic cable.
2. A specified length of fiber optic cable is not installed in maintenance loops.

I. Common Grounding Problems

1. Failure to connect poles, junction boxes and other equipment to the service ground by an insulated AWG 8 soft-drawn stranded copper wire.

14-Day Field Test

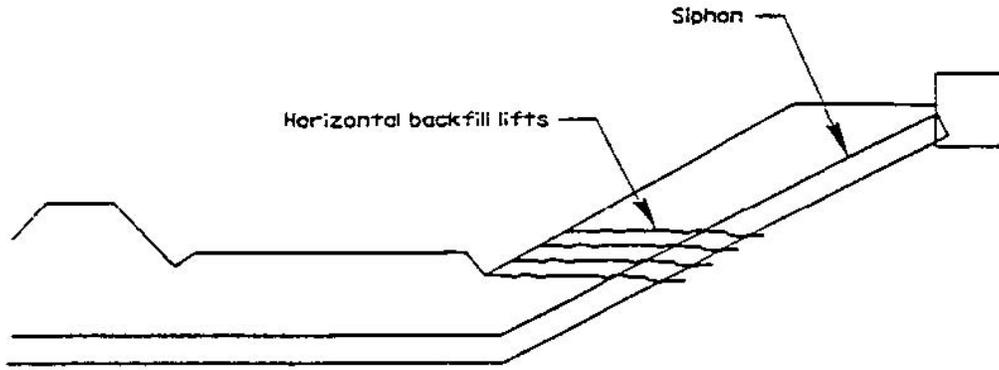
It is the intent of this specification to provide two weeks of standard operation with photocell, manual, or other specified turn-on control. During this test, the Contractor should be responsible for all corrective work resulting from improper installation, workmanship or materials. Following successful completion of the test, the Resident should recommend partial acceptance covering signalization. The cost of power consumed during the test period should be borne by the agency or agencies assigned maintenance responsibility by the cooperative project agreement.

Documentation for Pay Quantities

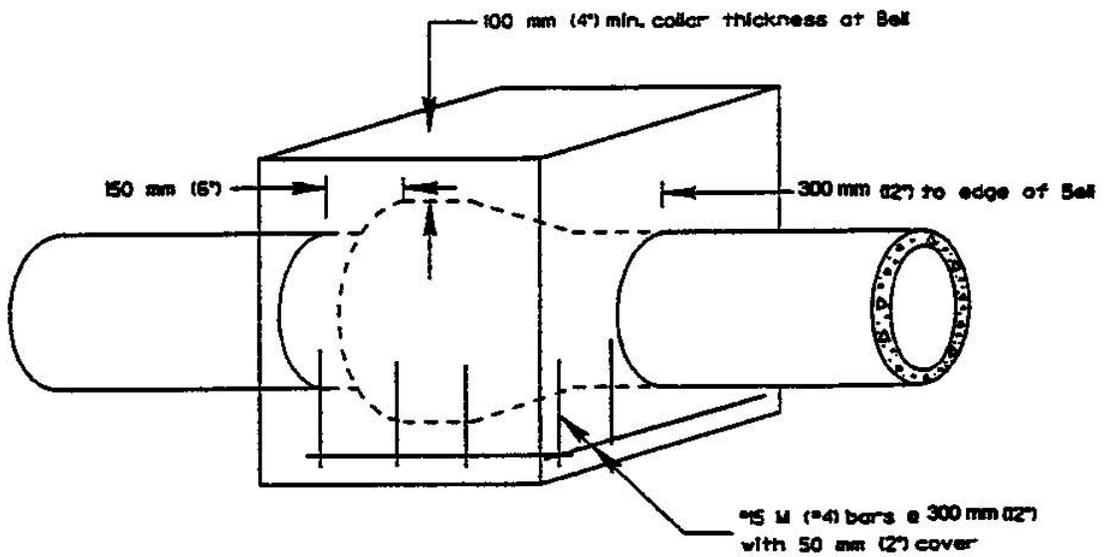
The diary shall be used to verify the activity, date, and location of the work.

Reports

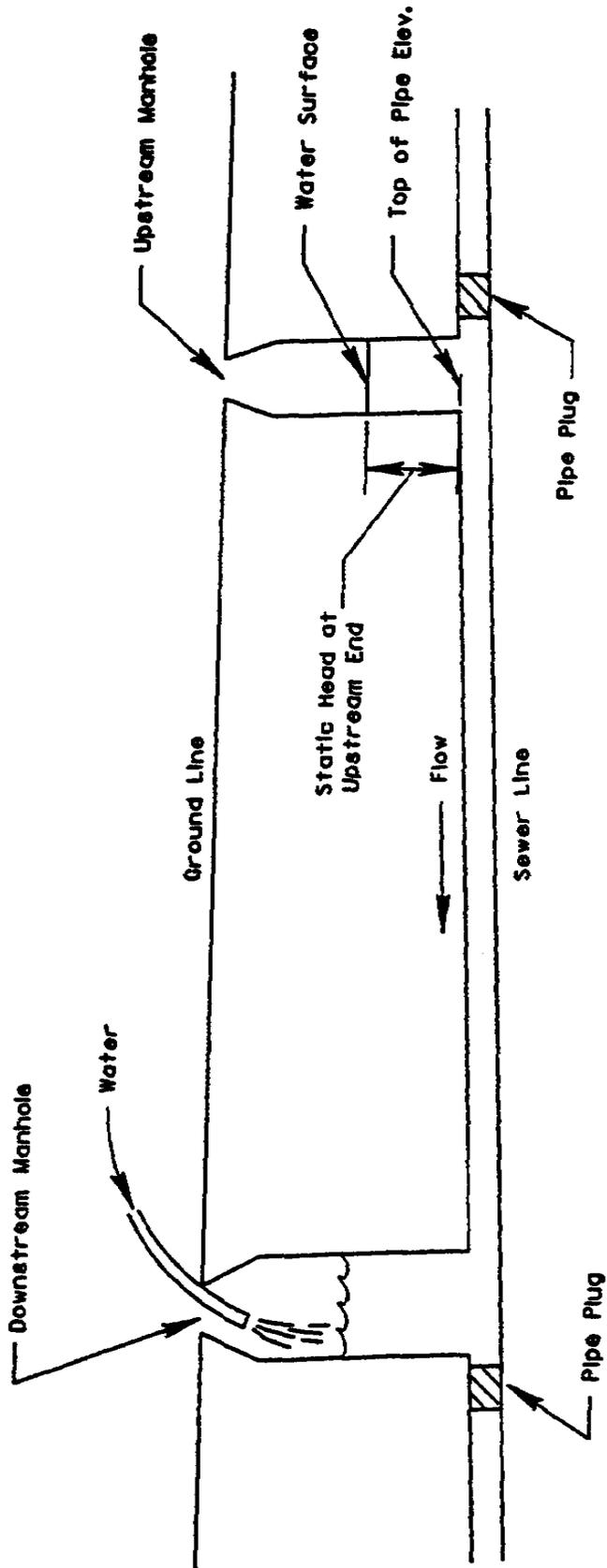
None.



Backfill of Siphon Section in Back Slope



Repair of Joint with Concrete Collar



Testing Sewer Pipe Line